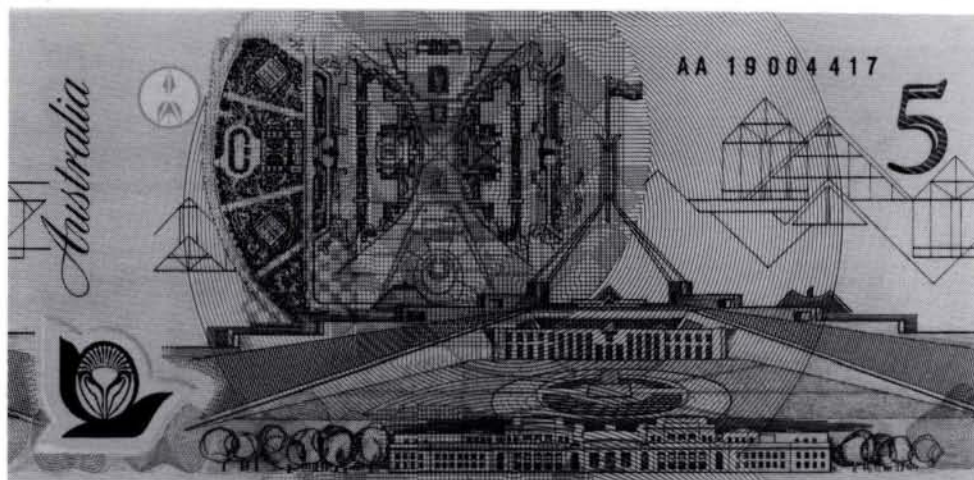


International Bank Note Society Journal



O V D — The Bank Notes of the Future...p. 5

Volume 32, No. 3, 1993

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I.B.N.S. Journal

Volume 32, No. 3, 1993

Editor

Steve Feller

Physics Department, Coe College

1220 1st Avenue, N.E.

Cedar Rapids, Iowa U.S.A. 52402

Telephone: (319) 399-8633

Home Telephone: (319) 393-7052

FAX: (319) 399-8748

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President's Message

The theme for this message is *FOCUS*. I would submit that those of us who are most successful in our chosen endeavors are those who are able to *focus* the best: identify the important things that will help us achieve our objectives and then concentrate our efforts on them. This is far from easy. In fact, more often than not the most difficult part of achieving good focus is that of taking the first step: deciding on the objective we want to reach. Two common expressions, one exhortative and the other critical, allude to this: "Keep your eye on the ball;" and, "He can't see the forest for the trees." So what does all of this have to do with our hobby, and I.B.N.S. in particular? Think back for a moment to the time when you first decided to collect paper money. Which collecting theme, from among the almost limitless ones available, did you choose? Or, in the beginning, did you even have a "collecting theme" at all? Most of us, I suppose, started picking up and saving these interesting pretty little pieces of paper somewhat randomly, and then as time progressed our interests, and our collecting thrusts, become more defined. Twenty years ago, collecting world paper money was largely catch-as-catch-can. Very few people knew what was "out there," and finding out was a daunting task in and of itself. I had decided to collect the notes from all the countries I had been in (about 40 at the time) and each time I ran across a piece I didn't have, I'd buy it. Then came 1974, and the world changed forever! That was the year that saw publication of the first edition of Pick's *Standard Catalog of World Paper Money*. I'll always remember the hours late into the night I spent pouring over it, in absolute awe. Never in my wildest dreams had I envisioned that there could be so much material just from the countries I had visited! I also came to the immediate conclusion that never in

continued on page 32

Editor's Column

This past week, at the end of August, I was visiting my wife's relatives in the San Francisco area. The fiancé of my wife's second cousin is a marketing person for a company which produces sophisticated state-of-the-art printing software for Mackintosh computers. We got into a spirited discussion about what can be done with modern imaging programs and I broached the subject of what were the theoretical possibilities involving paper money. It was clear to me that he had been asked this question several times in the past. His answer was direct and emphatic: The technology and software exists now to make nearly perfect, extremely high quality color copies from the computer and available printers (we didn't discuss the paper question.) I must say I left the discussion feeling nervous (again) that the security of, at least, United States currency is potentially under serious attack.

You will notice that the topic of modern security devices on paper money is the theme of two of the articles in the current issue. One is by Dr. Anthony Michaelis of the United Kingdom ("O V D — The Bank Notes of the Future") and the other is the work of Peter Symes of Australia ("Security Threads"). They certainly seem timely and important to me.

On the convention side of the hobby it is time for our annual London Congress (October 9 and 10 details are in this issue on page 48) and I urge fellow members to attend. I am only sorry that I cannot.

Best regards from a very moist Iowa,

Steve Feller, editor

Society Officers

President

Clyde Reedy
P.O. Box 670504
Marietta, Georgia 30066
U.S.A.
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General Secretary

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Office: 49-89-313-6515
Home: 49-89-313-9702
FAX: 49-89-314-7603

Journal Editor

Steve Feller
Physics Department
Coe College
Cedar Rapids, Iowa 52402
U.S.A.
Office: (319) 399-8633
Home: (319) 393-7052
FAX: (319) 399-8748

First Vice President

Lance K. Campbell
P.O. Box 204
Mary Esther, Florida
U.S.A. 32569
(904) 884-6889

Treasurer

Joseph E. Boling
P.O. Box 8099
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Hemet, California 92543
U.S.A.
(714) 652-8461

Newsletter Editor and

I.B.N.S. Publicity
Lance K. Campbell
P.O. Box 204
Mary Esther, Florida
U.S.A. 32569
(904) 884-6889

Second Vice President

Jos Eijssermans
Mathilde Wibautstraat 92
5912 JK Venlo
Netherlands
31 (077) 541440
FAX: 31 (077) 521654

Assist. Gen. Secy.,

Rec'ding Secy./Asst. Treas.
Mrs. Sally Thowney
36 B, Dartmouth Park Hill
London
NW5 1HN
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071 281 0839

Chair, Education

Committee
Lawrence Smulczynski
311 Ranch Road, 620 South
Box 182
Austin, TX 78734 U.S.A.

Research Assistant

John Humphris
P.O. Box 34
Sidney, OH 45365 U.S.A.
(513) 402-8989

Chairman, Grievance & Disciplinary Committee

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Letters to the Editor

Dear Editor,

I would like to correct the statement by J. Bartholomew (*I.B.N.S. Journal*, Vol. 32, No. 1, 1993) that the Royal Bank of Scotland issue in December 1992 marking the European Community Summit is "the first commemorative bank note in Scotland."

In fact, the first commemorative bank note recorded anywhere in the world was issued in Scotland, by Leith Banking Company to mark the state visit to Scotland in August 1822 by George IV—first visit by a reigning British monarch for 219 years. The bank issued a set of three notes—£1, £5 and 1 guinea—all with vignettes depicting scenes of the king's arrival at Leith Harbour, just outside Edinburgh, where he first set foot on Scottish soil. Notes in the series dated as early as 1823 still survive, so while they clearly mark the king's visit, they were also issued very close to the event, fully qualifying the notes to be classed as commemoratives.

While the Leith notes are widely recognized as commemorative, there may be two other Scottish notes that fall within this category the redesigned £1 and £5 notes of the Bank of Scotland, first issued in 1945 (P-96a and P-97). 1945 marked the 250th anniversary of the founding of the bank, which was established by an act of the Scottish Parliament dated July 17, 1695. Charles Malcolm, in his history "The Bank of Scotland 1695-1945," quotes from Stanley Cursiter, director of the National Gallery of Scotland, on the origins of the 1945 issue, which used, in slightly modified form, the designs introduced in 1885 by William S. Black and which continued on the Bank of Scotland notes for the next 83 years.

Cursiter wrote: "The £5 note of 1885 was large and handsome, with generous margins and deckle edges to its handmade paper. Conditions

in 1945 have necessitated a smaller note, but the new issue, *to commemorate the 250th anniversary of the founding of the Bank* (my italics), reproduces, on a reduced scale, the old note exactly as it was designed by Black." And elsewhere: "It is particularly gratifying that the 250th anniversary should be marked by the reissue of Black's notes, even if slightly modified."

The first issue of the £1 note was dated January 4, 1945 and of the £5 note, January 3, 1945. The dates do not coincide with the date of the founding act, nor is there anything on the notes to indicate they are commemorative in intent. However, Malcolm's work, and the early 1945 first-issue date, suggest the earliest date of each note—which continued to be issued for several years—has some claim to being a commemorative.

Regards,

Ron Richardson

I.B.N.S. #4563

Columbia Notes

Box 16058

Lynn Valley Post Office

North Vancouver, V7J-3S9

B.C. Canada

Dear Editor,

Although I have only recently joined the I.B.N.S., I have collected English bank notes since 1969.

I am particularly interested in replacement notes and experimental notes such as the multicolored £5 experimental notes for Optical Character Recognition (OCR)—"English Paper Money" (Vincent Duggleby) ref. B344.

It is noted in the catalogue that the serial No. 91 falls outside the normal range, the notes being prepared in sheets of 18, five sheets using up 90 serial numbers.

A similar observation is made regarding an earlier £5 note signed

by J. B. Page—catalogue ref. B334.

Duggleby's notes indicate that this series has been traced to 832 and whilst one might expect the numbers to run to 90, I have a note serial no. 91Z 689610.

Is this a further experimental note as yet not catalogued?

I am sure you have many members who specialize in the English series and I would welcome their views—perhaps even those of Vincent Duggleby!

Yours sincerely,

Ralph Brighton

I.B.N.S. #6292

52 Starre Road

Buny St. Edmunds

Suffolk IP33 EXH

England

P.S. I would not dream of sending a photocopy of the note (illegal!). However, if it is of genuine interest and would help for verification purposes, I would happily let the Society (or Vincent Duggleby) have sight of the note.

Dear Editor,

My main collecting interests are Greenland, followed by the Faeroe Islands and D.W.I. I'd be grateful for information you might have about articles covering paper money, coins, tokens, etc., relating to those countries, other than those which I'll find referenced in the *Journal Index*.

Thanks so much!

Yours truly,

Bruce Levy, I.B.N.S. #5923

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O V D — The Bank Notes of the Future

By Dr. Anthony R. Michaelis, I.B.N.S. #4516

Editor, *Interdisciplinary Science Reviews*, London, England

Ever since the invention of bank notes by the Chinese 1000 years ago, they have been counterfeited, producing some criminal gains until the perpetrators were almost invariably caught. Counterfeiting technology followed the technology of printing the notes until today, when new electrostatic techniques have given the counterfeiters an unexpected advantage for certain monochrome notes, such as US currency. However, the use of O V Ds, "optically variable devices," such as transparent holograms, should produce the final answer, the bank note of the future that cannot be imitated—at least for the time being.

"US \$100 bills will no longer be accepted for exchange," so reads the prominent notice displayed today at the counters of banks in Sydney, Australia. If the highly skilled and experienced tellers are no longer expected to distinguish between a genuine and a counterfeited US \$100 note, how can the ordinary user be relied upon to detect any difference? This perilous state of affairs must cause deepest concern to the US authorities, foremost the Secret

Service, founded in 1865 and charged with the duty to eliminate dollar forgery. As counterfeiting the US \$100 bill became widespread in the Far East during the last decade, a special Far East counterfeiting task force was established in November 1984, but its success was limited.

Counterfeiting technology

Almost all histories of bank notes, particularly Bloom and Kranister, carry lurid descriptions of successful counterfeiters and the penalties to which they were exposed. Rochette devoted an entire booklet to illegal money making. In every country of the world it has always been regarded as a most serious crime to counterfeit legal tender, to be punished with death until well into the middle of the 19th century. The reasons for such severity were twofold: the deeply felt insult to the king, the sovereign or the state, whose face or insignia appears on each note, and secondly, financially, the loss of seigniorage which each forged note represents. As the cost of printing a bank note is minimal, perhaps a few cents compared with its face value, all

legal production of bank notes offers an enormous profit, the so-called seigniorage. Even the earliest surviving bank note, the Ming 1 kuan issued by the Emperor Hung-Wu (1368-1398 AD), carried the warning: "Whoever counterfeits notes and circulates them will be beheaded." The assignats, the bank notes of the French revolution, had a similar inscription on each note "*La loi punit de mort le contrefacteur*" and in England the abolition of the death penalty by hanging for counterfeiting Bank of England notes was not effected until 1832.

If a counterfeiter wants success he must solve two basic technological problems: he must produce a substrate, mostly paper, as closely as possible resembling the original, and then imitate the design of the note on it. To be profitable, his production run must exceed a given minimum, as otherwise he must confine himself to altering by an individual drawing the face value on the note. The classic example, mentioned by Kranister, was the genuine German 100-reichsmark note of 1924 where the figure of 100 was redrawn as 1000. The most extraordinary story of forging the thin paper on which French notes are printed was told by Bloom about Bojarski, a Polish engineer living in Paris in 1964, the year of his apprehension. He had produced more than 50,000 forged notes of 100 NF during 13 years, using a modified offset printing machine which he had bought. For the thin paper production, Bojarski used a bidet, cigarette paper and rainwater.

The exact opposite to the many loners who tried their luck and who, with the one exception of a Japanese forger, were all eventually caught



Figure 1. Genuine or Counterfeit?

Australians and many others can no longer distinguish it and therefore do not accept it.



Figure 2. Cartoon of 1819 showing John Bull about to be arrested for the possession of forged notes. (C) British Museum

and convicted, is the counterfeiting by one government of bank notes of its enemy as a weapon of war. The British were apparently pioneers and during the American War of Independence (1775-1783) a very large number of false Continental currency bills were produced, with copper-plate engraving and hand-set type face. Because of their large number, they soon lost their value. The printer Benjamin Franklin developed "nature printing" as a countermeasure which he produced from 1739 to 1764. Government counterfeiting, one of the earliest modern secret weapons, was also used by Napoleon during his occupation of Austria in 1806, with the famous Banco-Zettel. He also ordered the printing of false Russian bank notes.

The largest and most successful governmental counterfeiting operation was "Operation Bernhard," the Nazi manufacture of British currency during World War II. Over one million notes were printed. Had these been circulated as intended, they would have constituted a very serious threat to England's economy. They were so perfect that only

scrupulous inspection under magnification could distinguish the genuine large white note from a false one and hence the counterfeiting must be considered as successful. Burke has in his book given us a full description of the least well-known of the many crimes of the Nazis. Inmates of the Sachsenhausen Concentration Camp were forced to engrave and print the notes, and an unknown number were used by the SS to pay spies and purchase arms in neutral countries. However, the bulk of the forgeries was still in the hands of the SS as World War II ended and was sealed in water-tight boxes and sunk into the depths of a little Austrian lake, the Töplitzsee. This operation did not escape notice and several attempts, a few highly successful, were made to recover them, and some of these notes found their way into numismatic collections, in spite of determined efforts by British and American counterintelligence agencies to confiscate them. These large white thin paper notes, unchanged in design since 1725, had only three simple security devices, a medallion of Britannia, a watermark and a white-on-black

sum block showing the amount. They were discontinued after 1957.

Countermeasures to Counterfeiting

The ideal deterrents to counterfeiting are twofold: the bank note must carry on it a mark or symbol which is instantly recognized with the unaided human eye, and the recipient of the note must be fully aware of the security feature and thus able to distinguish between genuine and counterfeit. This state of affairs is rarely, if ever, achieved in practice, as most modern security features are highly intricate and, more important still, as people in all countries never look at the bank notes in their possession. Apart from a brief glance at the color of the note, no features are ever regarded, let alone remembered. Hence the age-old success, and constantly repeated attempts, of counterfeiting. Only during the last decade or so have the government bank note printing authorities realized that the education of the public is far cheaper than the issue of a new series of notes. Most European countries now publish, together with a new bank note, an explanatory leaflet in full color giving details of the various security features which in their opinion should make the public aware of counterfeits (see pp 4-5 of the last issue of *The Journal*). As these leaflets are not cheap to produce, they are not widely available and can only be obtained from central banks, hence they do not fulfil their purpose. Apparently only Austria has seriously attempted to make its citizens knowledgeable about its bank notes and has issued special posters for schools and offered prizes to children for correct knowledge.

The inventor of what is now referred to as security printing of bank notes was Benjamin Franklin—his secret was kept for 226 years until Newman revealed it in 1963. For the printing of Colonial and Continental notes, Franklin was the first to employ "nature printing," an

ingenious process of making plant leaves appear in great detail on his notes. He placed a moist piece of textured fabric on a smooth area of soft plaster and laid one or several leaves onto the cloth. When pressed flat, a second layer of plaster was superimposed, allowed to harden and could then be used as a mold for casting type metal and for flat bed printing. Many different leaves were used by him for the beautifully printed notes, now rare collector's items. They still feel today like intaglio printing and their fine details could not be reproduced at the time by counterfeiting.

Of all the inventions to prevent counterfeiting, the watermark and the security thread are still the best and they appear on most modern

bank notes. The watermark is a design incorporated into the paper during manufacture, visible when the note is held up against the light. It is, of course, useless at night and only of value if the recipient of the note recognizes the genuine design. It was first employed by the Bank of England in a primitive form in 1697, according to Doty, but Kranister states that a Swedish bank note of 1666 had a watermark. Today there are four main types: the coat of arms of the country, an animal or flower, a human figure or mythological character and, most frequently perhaps, the same personage which figures on the face of the note. According to Doty, the metallic security thread was first introduced on Bank of England notes in 1940.

The most recent improvement in 1990 was the impressing of the value of the note onto the security thread on the new series of German bank notes. It can, however, only be clearly seen through a magnifying glass and therefore does not fulfil our ideal specification as stated at the beginning of this section.

In their constant efforts to improve bank note security, a number of other devices have been included in modern bank notes, but they require skilled inspection and auxiliary equipment. There is the "kip effect" or "tilt effect" which requires the bank note to be tilted at a certain angle against the light when additional printing will appear on the genuine note, but not on the counterfeit. It is used for example on the latest German 100 deutsche mark note when the letters "DM" appear on tilting. It is often difficult to see. Another relatively new device is "microprinting" with letters only a fraction of a millimeter high. A powerful magnifying glass must be used to read the text which will only appear as a blurred area on a counterfeit note. "Perfect registration" of front and back can be inspected by looking through the note, when in a genuine note a clear image appears. Ultraviolet-sensitive inks may be used for certain parts of the note which fluoresce when placed under special lamps which are commercially available. However, while no doubt installed at central banks and at bank note-issuing and checking government departments, these lamps are not in common use. Bloom tells the story of the most extraordinary invisible ingredient, impossible to analyze, incorporated into bank notes. It was proposed by the famous bank note-printing firm, Giesecke & Devrient, to include rare earth chemical compounds, of which there are several thousand, into bank notes and then to scan them through their special identification machine. Such machines would only be available at central banks, but they suffer from the same disadvantage



Figure 3. Australian \$10 polymer plastic note issued 1988 to commemorate Bicentennial with O V D of face of Captain James Cook.



Figure 4. Singapore \$50 polymer plastic note issued 1990 to commemorate 25 years of Independence with O V D of President Encik Yusof bin Ishak.

as all optical inspection machines. If the note is dirty, the machine fails, as the optical system cannot see the vital ingredient and chemical analysis is too lengthy. Rare earth compounds may never have been used in practice.

Improvements in printing technology since Franklin's nature printing have made one of the most important contributions to the security of bank notes. Lithography, offset and intaglio are all used today in various combinations, often on a single note. Orloff printing has proved especially valuable, although more expensive.

Paper and inks have constantly been bettered, and when flatbed printing was superseded by web printing from a continuous roll of watermarked paper, another step forward was taken. Few of the early security printing adjuncts, such as

curlicues and guilloche (a complex, multicolored, geometrical pattern), are still in use in modern notes, although they made counterfeiting much more difficult at the time. The present trend is towards simplicity and incorporation of computer controls into the web process, assuring automatic color control, automatic quality inspection, the marking of spoiled notes on-line and automatic sorting. Although bank note printing has always had to be a mass-production process, modern industrial techniques have made it a high-technology system of unequalled precision specifications where costs of production are irrelevant in favor of security.

The Australian O V D — a 20-Year Research Project

Credit cards were introduced during the 1950s and it was soon

found that counterfeiting them was much easier than counterfeiting bank notes. It can be done in minutes, states Bloom quoting R. Ahern: cheap presses, laminating machines and card embossers are used. Even credit cards printed on paper and then laminated up to proper thickness are hardly distinguishable from the genuine article. These were the early forgeries; later criminals learned that they could get valid account numbers from the discarded carbons interlaced with the sales documents signed by customers. Faked cards with valid account numbers forced the issuing banks to adopt an expensive, yet effective, security device, the hologram, visible on almost all modern credit cards as a handsome color, truly three-dimensional, picture. It is due to the reflected interference pattern of the laser-produced original picture. Mastercard introduced them in 1983 and VISA started them a year later. Feller has described in his book and his articles the numismatic connection of holography.

According to a historical note by S. Hamann, it was a radiophysicist, Dr. E.G. (Taffy) Bowen, who first suggested the use of optically variable devices in bank notes, having noted by chance moiré patterns on some diffracting foil wrappers of the London Army and Navy Store. The idea was taken up in 1971 by F.W. Brown of the Australian Reserve Bank's note-printing branch, who pasted together the first prototype plastic bank note in 1972. Such were the humble beginnings of the bank note revolution. Solomon has given a detailed account of how excellent forgeries of the Australian \$10 notes forced the Australian Reserve Bank to reconsider the basic production of notes in 1967 and of how the bank set up a "think tank" at the suggestion of its governor, Dr. H.C. Coombs. Solomon, an organic chemist and now Director of the Division of Chemicals and Polymers of the Australian Council of Scientific and Industrial Research

Organisation, together with his colleague, Dr. S. Hamann, experimented with synthetic paper based on polyvinyl alcohol fibers.

Although notes could be printed relatively easily on various plastic substrates, it became apparent that such substrates were not enough to produce really difficult-to-forge notes and Bowen's suggestion was taken up. It was necessary to overcome the facilities offered to counterfeiters by modern photographic reproduction techniques such as color printers available in many offices. This led them to the concept of introducing into bank notes transparent interference patterns which they called "Optically Variable Devices" (O V Ds). Their patent was filed in 1973, ten years before Mastercard introduced holograms into its credit cards.

The original patent specified a fiber-reinforced synthetic plastic film, a major departure from the standard cotton-based bank note paper. However, the opacity of the new plastic film would not have allowed the introduction of a transparent interference pattern, and thus Solomon and his colleagues turned to a clear transparent plastic substrate for bank notes, a revolutionary novelty.

Plastic materials had previously been used for bank notes, for example, the £1 Manx note, but then the object was to improve the durability of the note, not its security. During the 15 years of secret Australian research work which lay between the first patent and the issue of the first bank note to the public, the \$10 bicentennial note of 1988, innumerable problems had to be solved.

First came the mechanical properties of the substrate which should resemble as closely as possible the stiffness, feel and creasability of the normal paper note. At the time no plastic film was available to suit their specifications, but fortunately, Solomon wrote, lamination of existing materials provided an

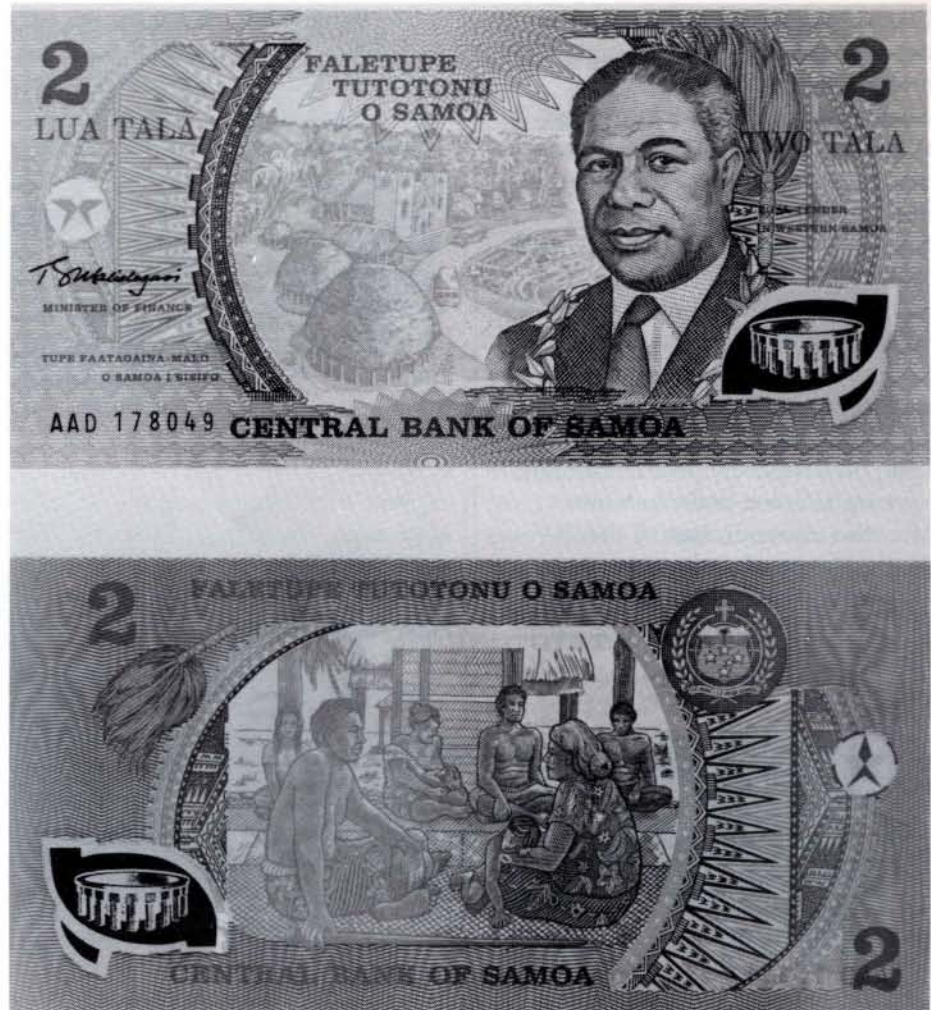


Figure 5. Samoan 2 Tala polymer plastic note issued 1990 to celebrate Golden Jubilee of the Head of State with O V D of a picture of a Kava bowl.

answer. Then their new technology had to be tested on a mass production scale, and in their research laboratory they finally printed 50,000,000 bank notes on plastic film, requiring the development of a continuous-web printing process. Special inks had to be formulated to opacify the clear film and yet leave clear areas around the O V D, the pre-eminent security feature.

The mass production of diffraction gratings, 750,000 of them, posed another laboratory challenge which had to be overcome. When their research started in 1974, commercially available gratings consisted only of straight lines or spirals. What was needed were gratings in which any artistic design could be drawn and this requirement led to

electron-beam lithography. Their final successful equipment was purchased from the CSIRO laboratory by the Reserve Bank and is now installed in their Craigburn Note Printing Australia production plant, from which 17 million bicentennial \$10 notes were issued in 1988.

The First O V D Bank note — Issue and Acceptance

The year 1988 can be accepted as the beginning of the O V D bank note-printing revolution, and the special edition of notes with the imprint "29 January 1988," as commemoration of the Australian bicentennial, will always remain a highly treasured collector's item. It is easily recognized by the prefix AA before its serial number, and only

1,00,000 were issued. The general circulation has the serial number prefix AB. The Reserve Bank of Australia gave some information about its general and special security features before its issue. Apart from intaglio printing for major design elements and fine-line, multi-colored, offset/lithographic printing for background designs, it was also the first Australian note to include microprinting and a see-through registration design. After numbering the notes, the O V Ds, manufactured on a separate production line, were transferred onto the notes. After the incorporation of the O V Ds, the sheets of notes were given a clear protective overcoating before being guillotined into individual notes.

The bank stated that the grooves constituting the diffraction gratings of the O V Ds were created by embossing and that there are between 400 and 1000 grooves per millimeter. The reflecting surface of the O V Ds is aluminum foil so thin that it is unable to support its own weight, according to the bank statement. The completely transparent area surrounding the O V Ds is claimed as the major security feature making reproduction, including photocopying, "all the more difficult" and, in the opinion of certain experts, virtually impossible, at least at present. The image of the O V D is a portrait of Captain Cook. The overall design of the note is by Mr. Harry Williamson.

As unusual as the production

technology of the commemorative Australian \$10 note was, so was the next step taken by the Reserve Bank of Australia, Sydney. One year after issue of the note, the bank commissioned Dangar Research Group to undertake a survey of the public's reaction to the plastic note and to publish the main results of the survey, that the note has "generally been well received." To conduct an effective field trial of the \$10 note, the issue of notes was concentrated in Newcastle, New South Wales, with the aim to match as closely as possible normal circulating conditions.

The Dangar Group employed both qualitative and quantitative research methods, interviewing first individuals from the general public, secondly bank tellers as cash handlers and thirdly shop assistants and check-out operators. The qualitative approach was used to guide the design of the questionnaire used in the quantitative research to establish the strength of community reactions. A representative sample of about 400 adults (18-65 years) from the Hunter Valley region was selected at random and all interviews were conducted face to face at the respondent's homes. Most interesting, in view of the great effort by the bank to produce a note difficult or impossible to counterfeit, was the statement "The public does not see potential for counterfeiting as being of particular concern to themselves."

The main conclusions of the report were as follows:

1. Overall acceptance of the new plastic note is as high as 48%. Outright dislike was only 26%. The remainder of the sample had no particular view.
2. The public perceives the main practical advantage of the new \$10 note to be increased durability and cleanliness.
3. The public perceives the main disadvantage of the new \$10 note to be springiness, stickiness, slipperiness and fold retention.



Figure 6. New Guinea 2 Kina polymer plastic note issued 1991 to commemorate South Pacific Games with O V D of a stylised bird.



Figure 7. Kuwait 1 Dinar polymer plastic note issued 1993 to celebrate the second Anniversary of Kuwait's liberation with an O V D showing head of a falcon and eight stars. Although this note has the imprint that it is not legal tender it is apparently widely used as such.

Those most affected by these qualities are tellers, cashiers and others who handle substantial quantities of cash in the course of their work.

A total of 12 prepared statements were read out to each person interviewed and in the publicly available report detailed percentages of agreement or disagreement are given. The suitability of the new plastic notes for use in currency-processing machines, although an important general issue, was not actively canvassed in the community survey. It was stated, however, that the Reserve Bank was fully aware of this aspect and it is known from other information that further research is devoted to making all new plastic notes compatible with the generality of such machines.

In this context it is perhaps

interesting to compare the Australian reaction to plastic bank notes with O V Ds to the opinion of the US Bureau of Engraving and Printing which Feller quoted in one of his articles. He quoted I. Polikoff of the bureau who stated that a thorough investigation of the protection of the US currency, costing \$7.5 million, had been carried out, including \$5.9 million on O V Ds and holography. A final negative decision was made, however, by the secretary of the treasury, Mr. Baker, the main reason being that holograms would not stand up to the stresses of circulation and thus would impair the durability of the notes. Secondly, placing holograms on bank notes would drastically alter the appearance of the familiar greenbacks. This was thought to be undesirable as extensive testing of citizens indicated that

"they were quite happy with the existing appearance of the current notes." Only this last, quoted, opinion agrees with the Australian report as the general public never looks closely at any bank notes and is quite unaware of the importance of security devices for their currency.

Plastic and Optical Security Printing

Note Printing Australia, a branch of the Reserve Bank of Australia, was not the first to use plastic material for printing bank notes, nor the first to use optical security devices. Apart from those described below, there may well be others of which I am unaware.

HAITI 1979 Printed on Tyvek plastic by the American Bank Company, they were issued in denominations of 2 gourdes, 50 g, 100 g and 500 g. (P231, P235, P236 and P238).

ISLE OF MAN 1983 Printed on Bradvek plastic by Bradbury, Wilkinson & Co., New Malden, Surrey, England, it had a denomination £1 and was issued by the Manx government. It was withdrawn after a few years (P39).

THAILAND 1987 Printed on paper with a blue and red security thread, and issued on December 5, 1987 to commemorate King Rama IX's 60th birthday, it had the unusual size of 160x160mm. In the top left hand corner it had a mythological picture in intaglio printing appearing green, but black when tilted. No doubt a special ink gave this optical surface effect. Denomination 60 baht (P91).

CANADA 1988 Printed on paper, it carried in the top left hand corner a small, 12x10mm black optical security device, which on tilting showed golden; it has the value of \$50 imprinted. On front, Mackenzie King, on back, a snowy owl (P88). Similar \$100 and \$1,000 notes exist.

AUSTRIA 1988 Denomination 5000 schilling, this note printed on paper had an optical security device showing W.A. Mozart which, on tilting, changed color.

AUSTRALIAN O V D NOTES The success of the Australian \$10 commemorative notes issued in 1988 and their ready acceptance by the public persuaded Note Printing Australia, a branch of the Reserve Bank of Australia, to manufacture and sell similar commemorative notes to other countries in the Southeast Asia region.

SINGAPORE 1990 To commemorate the 25th anniversary of independence, a \$50 note was printed on polymer plastic with Singapore's president, Encik Yusof bin Ishak, in the central O V D. Of these notes, 300,000 carried the anniversary date August 9, 1990.

SAMOA 1990 To celebrate the golden jubilee of the head of state of Western Samoa, Susuga Malietoa Tanumafili II, a 2 tala plastic polymer note was issued by the Central Bank. The OD is a vignette of a kava bowl, and the serial numbers have the prefix A.

PAPUA NEW GUINEA 1991 This polymer plastic note worth 2 kina was printed to commemorate the 9th South Pacific Games. The OD represents a stylized bird, transparent to the viewer from both sides.

KUWAIT 1993 This 1 dinar note on polymer plastic was issued by the Central Bank to commemorate the second anniversary of the liberation of Kuwait on February 26, 1991. Its O V D is the head of a falcon, surrounded by 8 stars. The names of the 34 countries supporting the liberation are printed in legible microprinting.

INDONESIA 1994 The end of the First Long Term Development Period on March 31, 1994 is commemorated on a plastic polymer note of 50,000 rupees. The O V D on both sides, surrounded as usual by a clear and transparent plastic window, shows the portrait of President Soeharto.

The obvious success of these commemorative notes, all available



Figure 8. Indonesian 50,000 Rupees polymer plastic note to be issued in 1994 to commemorate the end of the First Long Term Development Period on 31 March 1994 with O V D showing the portrait of President Soeharto.

in special souvenir folders from Note Printing Australia, Craigburn, Victoria, Australia, must have persuaded the Reserve Bank to issue a new series of Australian currency notes of which the first, the \$5 note, was also printed on polymer plastic with an OD showing a gum flower in a clear transparent window. Other notes of higher denomination are to follow in the next three years. The \$5 note became available in a souvenir folder in March 1993, serial number prefix AA, but is not dated.

Conclusions

In the 1000-year-old battle

between counterfeiters and governments enjoying the profits of seigniorage, the advantage has shifted between the two combatants from time to time. The weapons have been ever-improving printing technology and the invention of novel security features on the part of governments to whom costs of production were secondary in their fruitless search for perfect security. The constant success of counterfeiters has always resulted from the fact that the public never looked at their currency and was thus relatively easily duped. During the last decade or so the counterfeiters have been able to employ photographic and electrostatic reproduction machines,

Figure 10. The bank note printing hall of Note Printing Australia at Craighburn as seen from the visitor's gallery.

and this was especially valuable to them for monochrome bank notes. The advantage swung again to the government side when, after 15 years of intense and difficult scientific research at a proper research laboratory, O V Ds were invented in Australia. In the opinion of qualified experts, O V Ds should insure, for the foreseeable future, bank notes which are unforgeable with presently available counterfeit technology. But nothing will last forever, and even these may be counterfeited one day. Only greater public educa-

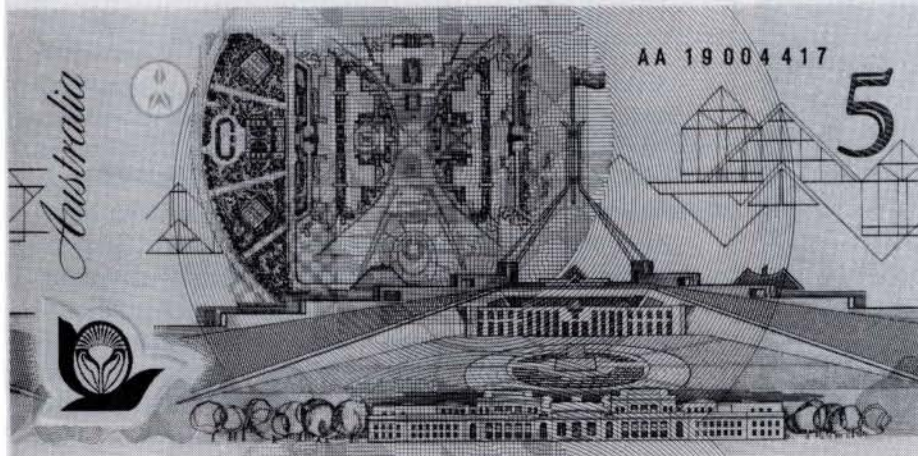


Figure 9. Australian \$5 polymer plastic note issued in 1993 as general currency now in circulation. The face is Queen Elizabeth II, the back the new House of Parliaments in Canberra. Its OD is a gum tree flower.

tion and continued scientific research will delay counterfeited O V Ds for as long as possible.

One further thought may be appropriate. As public confidence in currency is the vital basis of paper money, the bank note-issuing authorities have always been most conservative and have shrunk from any innovations that might undermine this confidence. Detailed improvements in printing technology were only reluctantly accepted, but one of the basic characteristics of bank notes, the paper substrate, has remained unchanged since the Chinese used mulberry bark for printing paper 1000 years ago. A "think tank" and an interdisciplinary team of physicists and chemists were needed to bring about a real revolution in bank note production. This lesson must be learnt, research must continue, and thus keep the note-issuing authorities always one step ahead of the counterfeiters.

Acknowledgment

I should like to express my thanks for help and advice to Mrs. Claire Lobel of Coincraft, London, and to Mr. G. Toletti, the curator of the Pick Collection, now in the



Figure 11. Inside the bank note vault of Note Printing Australia at Craigiburn.

possession of the Bayerische Hypotheken Bank, Munich, Germany, who have generously shared with me their great experience and knowledge in the wide field of bank notes.

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Author's Address:

Spectrum House
Hillview Gardens
London, NW4 2JQ, U.K.

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CALL FOR NOMINATIONS

All officers and members of the Board of Directors for the I.B.N.S. will be elected in 1994. The deadline is March 1, 1994. Please send nominations to one of the following:

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P.O. Box 257, Sutton Surrey SM3 9WW England
or

Bob Brooks

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or

Milt Blackburn

Box 33917, Station D Vancouver, B.C. V6J 4L7 Canada

The New Reichsmark Coupon Money of 1948

(An Interim Currency for 35 Days)

by Michael H. Schöne, I.B.N.S. #4803

Quite well known are the post-war activities of the four Allied forces with regard to a currency reform encompassing all of Germany. Little known, however, is the fact that their efforts were successful to a certain degree in the joint issuing of paper money: in February and March, 1948, they reached an agreement on the general conditions for an all-German currency reform and the designs of the new notes. Even after the Allied Control Council for Germany had broken up on March 20, 1948, the preparations for printing the new notes were continued, and proof notes—possibly even specimens—were produced until April 10, 1948. Although the facts are there and known, the notes haven't been shown to the interested public to this day. With the exception of the Allied experts engaged in the project, there is probably no one in a position to give details on the design, denominations and quantities of the paper money that were planned to replace the reichsmark notes.

The new all-German currency fell victim to the political power plays of the Allied forces. The finance sections of the military governments pushed through the ideas of their respective superiors. As a consequence, the opinions drifted away from the original intentions, and the plan went bust.

Today we know that as early as 1947 the United States ordered a "special army issue" to be prepared for Germany, the first emission for the three western zones of occupation. From February 1948, the ready bank notes were awaiting transfer to the Bank Deutscher Lander (BdL, Bank of the German Lander). With a probability bordering on certainty, the Soviet Union was also preparing to produce its own new bank notes for Germany.

Sufficient information can be found in the literature about the first BdL notes which were in circulation in the three western zones from June 21, 1948, and—marked B—in the three west sectors of Berlin from June 24, 1948. Not nearly as much information is available about the "alternative currency" in the Soviet occupation zone in June/July, 1948, which is known among experts and collectors under the name "coupon money" (officially "Rentenmarkscheine/Reichsbank noten mit aufgeklebten Spezialkuponen"—rentenmark/Reich's bank notes provided with coupon stickers). The popular term was "coupon mark" or, viciously and pejoratively, "wallpaper mark."

Roughly, the course of events was like this: After the

western powers had made their separate currency reforms only for the western zones, the negotiations aiming at an all-German currency reform ended without a result, and an agreement on a common currency for the four sectors of Greater Berlin couldn't be reached either. The Soviet Union was faced with the necessity to introduce new money in its zone of occupation without delay.

As there was no new money available, however, a way out had to be found. From June 24 to June 28, 1948, the old reichsmark money was withdrawn from circulation, provided with stamp-like coupon stickers (showing the same figures) which the printing officers turned out in next to no time (Figure 1), and re-emitted at a ratio of 10 reichsmark (old) to 1 reichsmark (new). In this way, the problem was solved also from the technical point of view. Within three days—from June 21 to June 23—thousands of volunteers were engaged in sticking the coupons to the bank notes (Figure 2). Similar ventures are known to have taken place in 1945, in Czechoslovakia and Hungary, for example.

In the supplement to the Decree on the Currency Reform in the Soviet Zone of Occupation in Germany, issued by the Deutsche Wirtschaftskommission on June



Figure 1.
Stamp-like 50-mark coupon with value indicator and year, but without currency designation and without specification of issuing bank

21, 1948, by order of the Soviet military administration (Order No. 111/1948), the following description was given of the coupons and the way they were to be stuck onto the bank notes:

- "1. The coupons bearing the figures "1," "2" and "5" are square in shape, 18 mm by 20 mm in size, and have perforated edges. The printed area of the coupon with the figure "1" measures 15 mm by 17 mm, is light blue, has a narrow white border, a white pattern at the center, and the embossed white figures "1" and (below) "1948" within the pattern.

The printed area of the coupon with the figure "2" measures 14 mm by 17 mm, is gaudy green, has a narrow white wave-line border, a white pattern at the center, and the embossed white figures "2" and (below) "1948" within the pattern.

The printed area of the coupon with the figure "5" measures 14 mm by 16 mm, is light brown, has a wave-line pattern along the border, a white pattern at the center, and the embossed white figure "5" and (below) "1948" within the white pattern.

- "2. The coupon bearing the figure "10" is square in shape, 22 mm by 26 mm in size, and has perforated edges. The printed area of the coupon with figure "10" measures 18 mm by 22 mm, is violet, has a white wave-line border, a white pattern at the center, and the embossed white figures "10" and (below) "1948" within the pattern.
- "3. The coupon bearing the figure "20" is square in shape, 24 mm by 31 mm in size, and has perforated edges. The printed area of the coupon with the figure "20" measures 20 mm by 27 mm, is reddish brown, has a narrow white border, a white pattern at the center, and embossed white figures "20" and (below) "1948" within the pattern.
- "4. The coupon bearing the figure "50" is square in shape, 27 mm by 32 mm in size, and has perforated edges. The printed area of the coupon with the figure "50" measures 23 mm by 28 mm, is gray-blue, has a white-patterned border, a white rosette at the center, and the embossed white figures "50" and (below) "1948" within the rosette.

- "5. The coupon bearing the figure "100" is square in shape, 26 mm by 43 mm in size, and has perforated edges. The printed area of the coupon with the figure "100" measures 22 mm by 29 mm, is dark green, has a patterned wave-line border, a white-patterned rosette at the center, and the embossed white figures "100" and (below) "1948" within the rosette.
- "6. The special coupons are fixed to the reichsmark and rentenmark notes of equivalent value; the coupon bearing the figure "1" is fixed to the 1-mark note, the coupon bearing the figure "2" to the 2-mark note, etc. The coupons for the 1-, 2- and 5-rentenmark notes are fixed to the right side of the front, at the center of the white field and close to its inner edge. The coupons for the 5-, 10-, 20-, 50- and 100-reichsmark notes are fixed to the left side of front, at the center of the white field and close to its inner edge. No stickers are fixed to the 1000 reichsmark notes. A coupon is considered unsuitable if part of it is missing, if it is made up of two or more parts, if it is dirty or if the pattern is not clear. Furthermore, a coupon is considered unsuitable for fixing when rejected after printing because of an unclear value figure, unclear pattern or deviation in the color rendition."

For those interested, here are the first paragraphs of section I of the above-mentioned decree issued by the Deutsche Wirtschaftskommission:

- "1. From June 24, 1948, the reichsmark and rentenmark notes of old design to which are fixed special coupons will be the legal tender in the Soviet zone of occupation.
- "2. All persons, enterprises, organizations and institutions living/seated in the Soviet zone of occupation are obliged to exchange in the time from June 24 to and including June 28, 1948, all reichsmark notes, rentenmark notes and mark notes of the Allied Military Authority in their possession for bank notes provided with coupons. The details of, and conditions for, the exchange are fixed below.
- "3. All small coins in circulation, whatever their denomination or design, continue to be legal tender at their face value and need not be exchanged.



Figure 2
Re-issued 20-RM note of 1929
with correctly applied 20-mark coupon



Figure 3
50-RM note of 1933 (genuine) with counterfeited 50-mark coupon;
easily recognizable is the rubbed-off ink on the left side

"4. As from June 26, 1948, reichsmark and rentenmark notes without coupons, as well as mark notes of the Allied Military Authority, will no longer be legal tender in the Soviet zone of occupation. The mark notes of the Allied Military Authority, reichsmark and rentenmark notes not submitted for exchange are canceled with effect from June 29, 1948."

From this official announcement it is obvious that stickers were fixed to the 5-rentenmark notes (with 7- and 8-digit serial numbers) of January 2, 1926 (Pick No. 171); the statements made by Jaeger/Haevecker, Pick/Rixen and Rosenberg need to be corrected.

Special coupons in 24 different designs were fixed to the following bank notes:

1 RentM 1937 (Pick No. 173)	5 RM 1942 (Pick No. 186)
2 RentM 1937 (Pick No. 174)	10 RM 1929 (Pick No. 180)
5 RentM 1926 (Pick No. 171)	20 RM 1929 (Pick No. 181)
	20 RM 1939 (Pick No. 185)
	20 RM 1933 (Pick No. 182)
	100 RM 1935 (Pick No. 183)

The 1000-RM notes (1936) were neither provided with a coupon nor were they in circulation at a tenth of their denomination. The bank notes of the 1924 reichsmark series (50, 100 and 1000 RM), valid until June 1948, were not reissued.

Little data is available on the extent to which the coupons had to be restuck because of poor gumming, but it probably was daily practice. The 50-rentenmark note of 1934 is said to have been in circulation with a sticker, also the 50- and 100-reichsmark notes of 1924. Not positively known are special cases as reported in the literature now and then, e.g. two 5-mark coupons fixed to 10-RM notes. Tricks are played to this day with the coupons: for instance, new coupons are often fixed to uncirculated bank notes. The well-informed collector can tell the fake from the genuine note by the incorrectly-positioned coupon. Contemporary press reports reveal that coupons were stolen by the sheet and also counterfeited. In *Der Tag*, a West Berlin paper, one could read:

"...neither the police nor the safe keeping of the coupon stocks could prevent the coupons from being traded at Potsdamer Platz yesterday—the same coupons which were planned to appear on the bank notes in the east sector from today on..." (No. 76 dated June 24, 1948, page 8); or "...there was a brisk trade in cigarettes yesterday...24 German cigarettes were sold for 50 reichsmark. The money, actually invalid, was then "modernized" by the dealers, who stuck coupons they carried with them in bundles, on the notes..."

(No. 79 dated June 27, 1948, page 6).

Collections are known which contain counterfeited 20- and 50-mark coupons, and fake 100-mark coupons are said to have been found too. The counterfeited 20- and 50-mark coupons are characterized by a flat, smooth print (contrary to the embossed value indicator and year of the originals), inaccurate pattern and indistinct

guilloches. Incorrect also are the perforations; the counterfeited 20-mark coupon has 16x12 perforations instead of the original 20x16, and the 50-mark coupon, 18x15 instead of the original 21x18. In addition, part of the 50-mark counterfeits were printed in water-soluble ink; a wet rubbing test (Figure 3) is usually made to find it out.

The Deutsche Wirtschaftskommission was ordered by the Soviet Military Administration in German (SMAD) to carry out the currency reform in the five Lander in the Soviet zone of occupation in Greater Berlin. Being the central bank in the Soviet occupation zone, the Deutsche Emission—und Girobank was only responsible for the money exchange—it never had the right to issue bank notes. The currency was not given an official name. Sometimes the terms "new reichsmark" or simply "new money" were used in papers and statistics, and the abbreviation "RM" was retained. According to an internal report given by the deputy director of the SMAD finance section to the ministers of finance of the Lander and presidents of the Lander-Emissions- und Girobanken, a total of 4.123 billion coupon marks had been made available for the currency reform. Of this, 1.8 billion marks cash were in circulation in the Lander and 200 million marks in Greater Berlin; the bank stocks amounted to about 1.515 billion (Lander) and 100 million (Greater Berlin). The emission reserve was given as 500 million marks. Of interest is the fact that some 11 million marks in coupon money were not presented when this currency was exchanged (from July 24, 1948) for the new deutschemark notes issued by the Deutsche Notenbank. Bruno Baum estimates the emission for Greater Berlin to have been as high as 280 million marks.

To this day no answer has been given to the question as to when the preparations for issuing the new DM notes in 1948 were concluded. Experts doubt that it was possible to produce as much as 4.145 billion DM in the short time from June 18 to July 24, 1948. Questionable in this connection is the statement made by Dr. Karl Steinhoff (then chief minister of Brandenburg) published on June 17, 1948 by the news agency DENA: "The chief minister of Brandenburg has declared that the eastern zone is fully prepared to take immediate measures should the western zones carry out a separate currency reform. Nobody need fear a flood of old money from the western zones. Berlin should worry less than it does now, for it wouldn't be let down by the Soviet zone."

The exchange procedures for the old and new reichsmark notes (coupon money) are generally known, as are the quota regulations for natural and juristic persons. It should be pointed out in this context that the area of validity included the five Lander of the Soviet occupation zone and all four sectors of Berlin. After the deutschemark (DM/West) had been introduced in the

three west sectors (known as B mark with a circular stamp and/or perforation), the magistrate of Berlin, on June 23, 1948, permitted two currencies to be valid in Greater Berlin, although the communist SED faction raised an objection. In the Soviet sector, however, the DM/West was not valid.

Rightly, most collectors classify the coupon money as national emergency money.

The sheets were letterpress printed, each sheet consisting of 100 (10 by 10) coupons. The facts that lots of coupons from remaining stocks were officially sold to collectors and that reichsmark notes with coupons are still available in large numbers are the reasons why these items are not very much sought after even though they had an extraordinarily short time of validity of only 35 days.

Denominations	Dimensions (mm)		Colors	Perforations
	Overall/Printed Area			
1 RM	20x18	17x15	blue on gray-blue	11x10
2 RM	20x18	17x14	green on gray-blue	11x10
5 RM	20x18	16x14	brown on ocher	11x10
10 RM	26x22	22x18	brown-violet on gray	16x14
20 RM	31x24	27x20	brown on light brown	20x16
50 RM	32x27	28x23	blue-gray on light blue	21x18
100 RM	43x26	29x22	green-blue on green-gray	28x16

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A Friend Pays Friendly. The Alternative for Legal Tender.

By John Schoonbrood translated from
De Volkskrant of Saturday, May 15, 1993,
by Jos Niewold #5293.

This article may not be very notafilic at first sight, but it may give some insight information about another obscure side of the hobby. It explains the working of a system in which the little paper things we collect function. After reading it, I realized that money has no more value than what the people who use it agree it has.

Closed village communities and subcultures in England, Canada and Australia have discovered the fantasy-valuta. A friendly turn and neighborly help are paid for in a professional way. The system seems to work.

One European coin. The ideal. When ideas like uniformity and unification are launched opposite reactions occur. It is a kind of fashion in England nowadays to establish your own local central bank, issue valuta, and to do business with each other outside the regular circuit.

This fashion has its roots in Canada and Australia, and worldwide there are three-hundred of these initiatives. These are all small-scale projects, which have all in common great social control, the closeness of a community which accepts the fantasy-coins, and the mutual possibility to settle friendly turns and forms of paying above the union rates in a peaceful manner.

The money-creation goes as follows: The initiative is taken by someone who plays the role of banker and his clients open an account with this banker. Then the valuta gets a name: "bucks", "greenbacks", or very chic "pecunias". The bank accounts are public, so the participants know all about each others solvency.

The accounts starts with a zero balance, and can become a positive balance by rendering a service or delivering a product to a current account member. The price of the service is accounted for (one way or another) by the banker, who credits the buyer, and debits the deliverer. In doing so the system keeps a balance.

The last project, started in England, is an initiative of Cliff Port of Kingston-upon-Thames. Cliff was not available for comment because he had to get rid of his debit balance, and therefore had to do some painting.

That is how the system works. Someone who wants to pay the hairdresser in greenbacks has to put his shoulder to the wheel for someone else in the local community.

Washing the dishes in the local restaurant will do as well.

It's in fact something between a friendly turn and working below union rates. The friendly turn is not paid, and the commercial prices are too high. So the job will be paid underhand, or will not be done at all.

By paying in greenbacks, or in beaks, as Cliff Port does, the gap between a friendly turn and commercial tariffs is closed. If everybody sticks to the rules, an exchange of friendly turns finds place, which, from a fiscal point of view, is no more than exchanging each others time.¹ One person mows grass in exchange for an evening of baby-sitting.

By putting a central bank between transactions, the network is extended, and relations between "participants" get more and more complicated. For the exchange of services, as in a normal economy, is no longer restricted to two persons.

Doing a job for fantasy-money is fiscally quite attractive. As long as the activities are kept on a low-scale, and are not on a commercial basis, the treasury can not act against it. What, in heavens name, is the value of a "greenback"? The social service would watch it Argus-

eyed, because a person who had done a job in this system was not available for the labor market. But even for the social service it is difficult to prove that such a job has gone too far. And even if it has gone too far, it's difficult to prove the value of the earned "greenbacks".

There are no legal restrictions against this system in the Netherlands. The Nederlandse Bank (Dutch central bank) allows the banker to issue his fantasy-money, but the bank may not give any credit.

As far as the Nederlandse Bank knows there have been three such initiatives in the Netherlands. One of these still exists. The Bartering Produkten Bank acts as a mediator between bartering businesses. One business has a product to offer, and sells it for a fictitious valuta, which value is exactly one guilder, to another business. The profit of such a transaction can only be spent within the Bartering Produkten Bank-system.

Participants must pay their Value Added Tax, though, for their transactions, which is quite simple because Bartering's valuta is worth one guilder. Bartering, however, is not an idealistic banker, and asks provision for his mediating.

For the idealistic projects, as in England, Canada, and Australia, the system can only function in closed communities, in which everybody knows each other. This could be isolated villages or subcultures of people who have an alternative way of life. In Cliff Park's village for example, the Beacon Centre for Environmental Concern is the connecting factor.

The risk of such a system is that it can blow over, and if that's the case, some of the participants are stuck with their worthless "greenbacks." Everybody knows the risk, so only few participants will save their "greenbacks": someone who has a negative balance on his account, must act quickly, if he wants to be able to face someone in the community. Cliff Port therefore can say rightfully that he stimulates the local economy. The only exceptional thing is that the local economic activity is not expressed in pounds sterling, but in "beaks".

¹ This is not new. Robert Owen's "Equitable Labour Exchange" functioned in the 1830's in London. He issued notes with a face value in hours. A man who had a ten hours note could buy products worth ten hours of work. (Source: Narbeth, Herdy and Stocker, *Historische bankbiljetten en aandelen* (Baarn, Neth. 1979) p 55)

International Bank Note Society

Combined Accounts June 1, 1992

General Fund, US, W H. Stickles	\$41,316.64
General Fund, UK, S Gupta (£11,272.90 @ 1.7465)	<u>19,688.12</u>
	\$61,004.76
RESTRICTED FUNDS:	
Life Membership Fund, William H. Stickles	\$27,025.37
Publications Fund, Alfred Hortmann	\$12,553.36
Amon Carter Award Fund, William H. Stickles	\$2,889.11
Ted Uhl Memorial Fund, William H. Stickles	\$1,305.75
Chinese Banknotes Collectors Society	<u>1,036.21</u>
	\$44,809.80
Total	\$105,814.56

William H. Stickles, Treasurer, I.B.N.S.

Combined Accounts June 30, 1993

General Fund, US, William H. Stickles	\$42,496.81
General Fund, UK, Sally Thowney (£4,927.55 @ 1.51)	<u>7,440.60</u>
	\$49,937.41
RESTRICTED FUNDS:	
Life Membership Fund, William H. Stickles	\$27,725.37
Publications Fund, Alfred Hortmann	14,525.00
Amon Carter Award Fund, William H. Stickles	2,908.02
Ted Uhl Memorial Fund, William H. Stickles	1,396.76
Chinese Bank Note Society, William H. Stickles	1,108.43
Advance Postage Fund, Milan Alusic	2,250.00
	<u>\$49,913.58</u>
Total	99,850.99

William H. Stickles, Treasurer, I.B.N.S.

The Japanese National Banks

by Joseph E. Boling, I.B.N.S. LM#8

The Japanese national banking system was established in 1873 to provide financing for Japan's emerging industries. Because of unfavorable reserve requirements and the fact that national bank notes were convertible into gold (at a time when no government notes had specie backing), few banks were established and few notes circulated. In 1876 these unfavorable aspects were changed and the number of banks skyrocketed.

The initial series of national bank notes was printed in the USA by Continental Bank Note Company. The early banks and a few of the banks in the second wave issued these notes. The second issue of notes was produced by the Finance Ministry Printing Bureau. In the table below, the two series of notes are shown as "1" and "2." Not all

issues thought to have been released have been observed; there are probably errors in the records.

The table is translated from the JNDA catalog and shows the location of each bank, its initial capital, and the present successor bank. See the I.B.N.S.'s catalog of Japanese notes or my article in vol 27 #1 of the *Journal* for more information about national banknotes and other Japanese note issues.

It is obvious from the capital figures that some banks' notes are more scarce than others. Notes of the 1st and 15th banks are the most commonly encountered pieces. Beyond those, notes bring prices based on individual interest in a given sale; to my knowledge there is no catalog that prices them by bank, city, or prefecture.

National Bank Establishment and Note Issues

Charter #	Location	Founding Capital Y1000	Note Series Issued	Present Successor Bank	Charter #	Location	Founding Capital Y1000	Note Series Issued	Present Successor Bank
1	Tokyo	1500	1 2	First Hypothec Bank	34	Osaka	200	2	Sanwa Bank
2	Yokohama	450	1 2	Yokohama Bank	35	Shizuoka	70	2	Shizuoka Bank
3	Tokyo	300	1 2	Fuji Bank	36	Hachioji	100	2	Fuji Bank
4	Niigata	300	1 2	Fourth Bank	37	Kochi	150	2	Shikoku Bank
5	Osaka	300	1 2	Mitsui Bank	38	Himeji	250	2	Kobe Bank
6	Fukushima	250	1 2	Fuji Bank	39	Maebashi	350	2	Gumma Bank
7	Kochi	140	1 2	Seventh Bank	40	Tatebayashi	150	2	First Hypothec Bank
8	Toyohashi	150	1 2	Tokai Bank	41	Tochigi	200	2	First Hypothec Bank
9	Kumamoto	100	1 2	Fuji Bank	42	Osaka	200	2	Sanwa Bank
10	Kofu	250	1 2	Yamanashi Central Bank	43	Wakayama	200	2	Sanwa Bank & Kiyomoto Bank
11	Nagoya	200	1 2	Tokai Bank	44	Tokyo	700	2	Fuji Bank
12	Kanazawa	200	1 2	Hokuriku Bank	45	Tokyo	100	2	Dissolved
13	Osaka	500	1 2	Sanwa Bank	46	Gifu, Tajimi	50	2	Aichi Industrial Bank
14	Matsumoto	100	1 2	Mitsui Bank	47	Chiba, Yawata	95	2	Hokuriku Bank
15	Tokyo	17826	1 2	Sixteenth Bank	48	Akita	50	2	Akita Bank
16	Gifu	100	1 2	Fukuoka Bank	49	Kyoto	200	2	First Hypothec Bank
17	Fukuoka	200	1 2	Eighteenth Bank	50	Ibaraki, Tsuchiura	100	2	Joyo Bank
18	Nagasaki	250	1 2	82nd Bank	51	Kishiwada	100	2	Sumitomo Bank
19	Ueda	150	1 2	First Hypothec Bank	52	Matsuyama	70	2	Iyo Bank
20	Tokyo	250	1 2	Shiga Bank	53	Shimane, Tsuwano	80	2	Yamakage Amalgamated Bank
21	Nagahama	100	1 2	Fuji Bank	54	Numazu	70	2	Shizuoka Bank
22	Okayama	200	1 2	Oita Bank	55	Hyogo, Izushi	50	2	Kobe Bank
23	Oita	200	1 2	Sanwa Bank	56	Akashi	50	2	Kobe Bank
24	Nagano, Iiyama	80	1 2	Officially closed	57	Fukui, Takefu	50	2	Hokuriku Bank
25	Fukui, Ohama	130	1 2	27th Bank	58	Osaka	120	2	Fuji Bank
26	Osaka	300	1 2	Shizuoka Bank	59	Hiroaki	300	2	Aomori Bank
27	Tokyo	250	1 2	Iyo Bank	60	Tokyo	250	2	Dissolved
28	Hamamatsu	200	1 2	Sanwa Bank	61	Kurume	100	2	Sumitomo Bank
29	Ehime, Uwajima	100	1 2	Mitsui Bank	62	Mito	100	2	Joyo Bank
30	Tokyo	250	1 2	Officially closed					
31	Wakamatsu	100	2						
32	Osaka	300	1 2						
33	Tokyo	200	2						

Charter #	Location	Founding Capital Y1000	Note Series Issued	Present Successor Bank	Charter #	Location	Founding Capital Y1000	Note Series Issued	Present Successor Bank
63	Nagano, Matsushiro	100	2	82nd Bank	110	Yamaguchi	600	2	Yamaguchi Bank
64	Otsu	500	2	Otsu Bank	111	Kyoto	150	2	Officially closed
65	Tottori	70	2	Kobe Bank	112	Tokyo	100	2	112th Bank
66	Okayama, Onomichi	180	2	Hiroshima Bank	113	Hakodate	200	2	Hokkaido Development Bank
67	Yamagata, Tsuruoka	80	2	Shonai Bank					
68	Nara, Koriyama	80	2	Nanbu Bank	114	Takamatsu	90	2	114th Bank
69	Niigata, Nagaoka	50	2	Hokuetsu Bank	115	Mie, Kameyama	70	2	Konan Bank
70	Kyoto-fu, Yodo	50	2	70th Bank	116	Niigata, Shibata	150	2	Fourth Bank
71	Niigata, Murakami	100	2	Fourth Bank	117	Nagano, Iida	110	2	82nd Bank
72	Sakata	80	2	Saga Bank	118	Tokyo	100	2	Fuji Bank
73	Hyogo, [rural]	140	2	73rd Bank	119	Tokyo	300	2	Dissolved
74	Yokohama	400	2	Yokohama 74th Bank	120	Ibaraki, Koga	100	2	120th Bank
75	Kanazawa	50	2	Merged with 45th Bank, July 1886	121	Osaka	200	2	Sanwa Bank
76	Gifu, Takasu	200	2	Togaki Joint Bank	122	Mie, Kuwana	150	2	122nd Bank
77	Sendai	250	2	77th Bank	123	Toyama	80	2	Hokuriku Bank
78	Oita, Nakatsu	80	2	Hachioji 78th Bank	124	Shizuoka, Shitamidera	50	2	Shizuoka Bank
79	Matsue	200	2	79th Bank	125	Yamagata, Tatecho	80	2	Yamagata Bank
80	Kochi	100	2	Shikoku Bank	126	Osaka	200	2	Officially closed
81	Yamagata	130	2	Yamagata Bank	127	Kagawa, Marugame	150	2	Shikoku Bank
82	Tottori	200	2	Fuji Bank	128	Gifu, Yawata	50	2	128th Bank
83	Mie, Uenonaka	50	2	105th Bank	129	Ogaki	70	2	Ogaki Joint Bank
84	Ishikawa, Daishoji	90	2	Fuji Bank	130	Osaka	250	2	Fuji Bank
85	Kawagoe	200	2	Saitama Bank	131	Osaka-fu, Obaichiban	60	2	Mitsui Bank
86	Okayama, Takahashi	80	2	Chugoku Bank	132	Kanagawa, Hodogaya	70	2	132nd Bank
87	Buzen Prov, Kokura/Oaza	160	2	Fuji Bank	133	Shiga, Hikone	100	2	Shiga Bank
88	Iwate, Ichinoseki	50	2	Iwate Bank	134	Nagoya	300	2	Tokai Bank
89	Tokushima	260	2	89th Bank	135	Kumamoto, Uto	80	2	Higo Bank
90	Morioka	50	2	Iwate Bank	136	Aichi, Handa	170	2	Fuji Bank
91	Fukui	50	2	Hokuriku Bank	137	Hyogo, Sasayama	50	2	Kobe Bank
92	Fukui	200	2	92nd Bank	138	Shizuoka, Futamata	150	2	Shizuoka Bank
93	Fukushima, Miharu	120	2	Toho Bank	139	Niigata, Takada	350	2	Fourth Bank
94	Hyogo, Tatsuno	50	2	Kobe Bank	140	Yamagata	100	2	Shonai Bank
95	Tokyo	200	2	95th Bank	141	Ehime, Saijo	50	2	Hiroshima Bank
96	Fukuoka, Yanagawa	80	2	Fukuoka Bank	142	Chiba, Choshi	50	2	Mitsui Bank
97	Saga, Ogi	90	2	Dissolved	143	Chiba, Inba-gun, Yachimata	100	2	Sanwa Bank
98	Chiba	120	2	Chiba Bank	144	Miyazaki, Obi	50	2	Obi Bank
99	Nagasaki, Hirado	70	2	Shinwa Bank	145	Miyazaki, Nobeoka	50	2	Miyazaki Bank
100	Tokyo	200	2	Mitsubishi Bank	146	Hiroshima	80	2	Hiroshima Bank
101	Fukushima, Yanagawa	110	2	101st Bank	147	Kagoshima	400	2	Kagoshima Bank
102	Nagasaki, Izuhara	50	2	102nd Bank	148	Osaka	200	2	Sanwa Bank
103	Yamaguchi, Iwata	80	2	Dissolved	149	Hakodate	130	2	Merged with 119th Bank, May 1885
104	Mito	120	2	Joyo Bank	150	Aomori, Hachinohe	100	2	150th Bank
105	Tsu	80	2	105th Bank	151	Kumamoto	65	2	151st Bank
106	Saga	300	2	Sumitomo Bank	152	Okinawa, Naha Higashi	130	2	152nd Bank
107	Fukushima	350	2	107th Bank	153	Kyoto	80	2	Merged with 111th Bank, January 1886
108	Fukushima, Sukagawa	50	2	Officially closed					
109	Oita, Saiki	60	2	Oita Bank					

Bold codes show that the indicated series of notes is unobserved for the bank. Named bank locations may not necessarily be where the banks were initially opened, as in those days some towns and villages were not well identified. [Translator's note: Where two location names appear, the first is the prefecture name. Local addresses within major cities are not translated. "Officially closed" is believed to mean closure through bankruptcy. Translated from *Nihon Kahei Katarogu* (the "JNDA Catalog"), Nihon Kahei-sho Kyodo Kumiai, Tokyo, 1986, by JOSEPH E. BOLING with corrections by Winston Koike and Hidetake Fujii.]

The Greatest Inflation in the World: Hungary 1945-1946

by Dr. Mihaly Kupa, I.B.N.S. #0111-H

The greatest inflation in the world began, in principle, as far back as 1935, with the announcement of the rearmament program of Gyor. It remained inconspicuous but latent during the Second World War, but grew rapidly after the defeat in 1945, reaching its apogee on July 29, 1946.

A few reference data are provided: At the time the pengo-value was introduced on December 31, 1925, the total paper money in circulation was 5,194 milliard Hungarian korona. Throughout this article European terms for high terms will be used, so that 1000 million = 1 milliard (U.S. billion), and 1000 milliard = 1 billion (U.S. trillion). At an exchange rate of 71,000 korona (crowns) to the dollar, this came to \$73,153,000. By December 31, 1937, only 545 million pengo were circulating, which at an exchange rate of 5.30 pengo per dollar, amounted to \$102,830,000. But by December 31, 1944, the total bank note circulation had risen to 20 milliard pengo, including 9 milliard carried west by fleeing refugees.

Inflationary fiscal policies really began in Hungary only in 1939, when Paragraph 155 of Article II of the Legal Code of 1939, the so-called "Defensive Law," decreed that government-authorized promissory state treasury notes could be taken up and discounted by the Hungarian National Bank without limit. The national bank was thereby relieved of the power or even the responsibility to protect the stability and value of the pengo. Hungarian bank note circulation consequently rose from one-half milliard pengo in 1939 to 20 milliard in 1944.

As one can see, gigantic quantities of money were circulating in

1945, yet the newly-formed Hungarian government had scarcely any money at its disposal. In Budapest, approximately 100 million pengo remained in the small treasury of the Hungarian Postal Savings Bank. This was available to restore some life to the rubble-strewn capital, and later to cover government expenses. These 100 million pengo, however, went very quickly. One could barely contemplate preparing more bank notes, since neither printing plates, paper, inks, nor even a single operating press were available.

The Budapest National Council had already authorized the mayor of Budapest on February 25, 1945 to circulate so-called "Foodstuff-Loan Notes" in denominations of 50, 100, 200 and 500 pengo, to a total value of 50 million pengo. This really meant that a loan, in the form of bank notes, could be raised from the citizens of Budapest. The government was also assisted by loans from the Soviet Union for 100 million pengo in March, 250 million in April, and 500 million in May, in the form of Hungarian bank notes seized by the Soviet Army during the war. In addition, on April 28, the Hungarian National Bank returned to circulation the 5 pengo notes dated October 25, 1939 (P 106). (For ease of reference, each bank note mentioned has been identified by its number from the *Standard Catalog of World Paper Money* (Sixth Edition). The author also has his own catalog of *Magyarország papirpenzei (Paper Money of Hungary)* I and II. Budapest, 1963 and 1964, but this is not widely available. It is the authoritative reference for varieties and emergency stamp-money, and is tetralingual: Hungarian, German,

French and English.) The mentioned five-pengo notes had been called in on August 5, 1942 and were awaiting destruction by the bank.

In the meantime, by vigorous effort, the Hungarian Banknote Printinghouse had managed to prepare enough bank notes to cover the most pressing needs of the government. New 100-pengo notes appeared in circulation on May 9, 1945, with the date of April 5, 1945 (P 111). During this same period, the money which was carried off to the West at the end of the war gradually began trickling back, chiefly in the form of the 1000-pengo notes of February 24, 1943, the so-called "Szalasi" notes (P 116). To combat this influx, the authorities issued Order No. 4250/1945.M.E., by which all 1000-pengo notes of the Hungarian National Bank, including older ones dated July 1, 1927 (P 94), had to be called in and deposited. As a replacement for these withdrawn bank notes, a 500-pengo note dated May 15, 1945 appeared on June 1, 1945 (P 117), and a new 50-pengo note dated April 5 appeared on July 5, 1945 (P 110).

The Soviet Union, as one of the occupying powers, had introduced into its occupation zone the so-called "Red Pengo Notes," in denominations of 1, 2, 5, 10, 20, 50, 100 and 1000 pengo, all dated 1944 (P M1-M9). These notes raised the amount of money in circulation even further. By March of 1946, the national bank had redeemed 3,945,034,005 pengo of these notes.

The Hungarian State Mint had been rehabilitated by midyear, so that on June 19, 1945, 25 million pengo in new aluminium five-pengo coins appeared dated 1945, along



with 20 million pengó in old two-pengó coins dated 1944, also aluminum. These had a very short life-time, however, since they, as well as all earlier metal coins still in circulation, were invalidated and called in on December 15, 1945.

To provide for its monetary needs, the government opened an account with the Hungarian National Bank, and by July 1, 1945 had withdrawn approximately 3 milliard pengó. New 1000-pengó notes appeared on July 16, dated July 15, 1945 (P 118). At this time, the regime floated securities for 9 milliard pengó, which the Hungarian National Bank accepted and discounted as it was requested to do, supplying the government with the corresponding National bank notes.

Again, a few reference data are given. On January 31, 1945, 20,766 million pengó in bank notes were circulating, which at an exchange rate of 250 pengó to the dollar amounted to approximately \$83,000,000. By June 30, 1945, 23,572 million pengó were in circulation, but a lower exchange rate of 627 pengó brought their real value to only \$37,565,000. Fifteen days later the bank note level was at 25 milliard pengó, but the black market exchange rate had fallen to 1290 pengó to the dollar.

The regime floated new securities for 6 milliard pengó in August, which again were discounted by the national bank. This perpetual covering of government operating

deficits by the issue of new bank notes resulted in a great increase in currency flow, which was aggravated by a steadily mounting shortage of real goods. At the beginning of September 1945, the finance minister prepared a budget for the remainder of the year based on the current rate of expenditure. The budget came to 112 milliard pengó, although the total anticipated income from all sources was scarcely 10 milliard pengó! The regime therefore floated new securities for 25 milliard in September, 70 milliard more in October, 310 milliard in November and 750 milliard pengó in December, all faithfully discounted by the National Bank.

Prices and wages had risen rapidly since July. If the cost-of-living index on July 15, 1945 is taken as 100, then by August 1 it had risen to 117.6, excluding rent, and by December 12, 1945, to 27,849! The official exchange rate for dollars was 8200 pengó on October 12 and 120,000 pengó on December 15. One gram of pure gold cost 13,897 pengó on November 2, but 144,935 pengó on December 15, 1945.

In defense of the pengó standard, the regime very belatedly issued Order No. 7160/1945.M.E. in October, according to which all foreign currency, securities and gold, as well as foreign claims against the Hungarian National Bank, had to be declared. This order had little real effect, however, aside from increasing the work load of the police and

the courts.

Because of the devaluations, it became perfectly clear to everyone in the second half of 1945 that the nation was faced with a collapsing currency. A race developed between prices and wages, which no longer, as previously, implied a stimulation of the economy. Instead, the entire Hungarian economic life became gradually paralyzed, and what is worse, demoralized. As a result, speculation reached such unrestrained heights that even keeping accounts in gold or dollars—a measure which had worked in the past—became shaky. A second disaster was the fact that, under the increasing hammer blows of the inflation, the remaining mobile capital of the nation was largely wiped out in a matter of days. Because of the acute shortage of goods, not everyone could rescue his capital by converting it into real property. The era of the flight from the pengó notes began, aggravating the shortage of real goods even more. A barter economy developed between city and countryside.

To help disentangle the rising currency traffic, a 10,000-pengó note dated July 15 (P 119) was placed into circulation on October 17 and a blue 100,000-pengó note dated October 23 (P 121), on December 12, 1945.

The extraordinary events convinced the Hungarian government that it had to apply the brakes to the financial collapse by decreasing the quantity of bank notes in circulation.



By an ordinance of December 19, 1945, No. 12,000/1945.M.E., all of the largest bank notes in circulation—1000, 10,000, and 100,000 pengó—had to be equipped with stamps of a special type in order to retain their full face value. Since these stamps sold for three times the value of the notes to which they were affixed, this measure had the effect of diminishing the total quantity of money in circulation by a factor of four. Bank notes which were not provided with stamps were to have only 25 percent of their face value. But to avoid confusion, these unstamped notes were pulled out of circulation. The same fate shortly thereafter overtook even those blue 100,000-pengó notes which had been stamped. At that time, 100,000-pengó notes were still a substantial sum of money, and the accidental loss of a badly fastened stamp led to misunderstanding and confusion. The blue note was replaced by a brown and blue-green version with the same design and date (P 120).

The 75 percent bank note reduction brought in a total of 383,399,619,000 pengó, but this sum was enough to cover the expenses of the government for only 11 days.

The bank note reduction, in turn, did produce a lowering of prices and foreign exchange rates. On December 18 the dollar was worth 154,100 pengó, and one gram of pure gold 173,400 pengó. By December 24 the dollar had fallen to only 103,400 pengó, and a gram of pure gold to 116,353. The cost-of-living index fell from 87,455 on December 19 to

42,668 on December 27, 1945. These decreases, however, were not as large as the decrease in bank note circulation. The inflation still continued.

All in all, in the course of 1945, the state treasury obtained 1160 milliard pengó from the Hungarian National Bank in exchange for securities in a like amount, of dubious value.

Such an extreme currency devaluation impelled the regime to introduce the adopengó (taxpengó), as a computational unit, on January 1, 1946, in order that there be some reliable standard of value. Accordingly, beginning first on January 5 and daily thereafter, the finance minister published a conversion factor between old pengó and taxpengó. This ordinance was quickly followed by another, which sought every possible means of restoring stability. Among other measures, the National Bank from January 10 on was permitted to deal only in notes and exchange expressed in taxpengó. This ordinance hastened the fall of the pengó, however, because every transaction with pengó notes had to be laboriously converted into taxpengó.

The initial purpose of the taxpengó was to stabilize government income. Taxes were assessed in adopengó, and had to be paid in adopengó when due, no matter how much the paper pengó had fallen in the meantime. There was an additional advantage, however. Wealthy businessmen could no longer borrow every pengó they could get

their hands on and buy real property with them knowing that when the time came to repay the loans, inflation would have made this repayment trivial. Loans made in adopengó had to be repaid in adopengó even though the conversion rate between pengó and adopengó had changed drastically. This move was designed to encourage the flow of investment capital back into the market.

The Hungarian Bank note Printinghouse and the other firms associated with it could no longer supply the required quantity of paper money, so all other up-to-date printing houses were also set to work printing bank notes. Since even these were not enough, the National Bank issued two new denominations: a million pengó (P 122) and a 10 million (P 123), both dated November 16, 1945, but issued on February 28 and April 2, 1946, respectively. The 100 million (P 124) appeared on April 30 and the 1 milliard (P 125) on May 13, both with a date of March 18.

The deterioration of the pengó standard led to an ordinance whereby after May 18, 1946, all 5, 10, 20, 50, 100, 500 and even 1000-pengó bank notes were finally called in. However, these issues were counterbalanced by new notes which the government obtained every month from the National Bank by floating new issues of securities: 1.3 billion pengó in January 1946, 6.0 billion in February, 35 billion in March, and approximately 600 billion in April.



Since the time interval between the issue of new bank notes was becoming shorter and shorter, the Banknote Printinghouse soon ran out of time to prepare new designs. For bank notes beyond the 1 milliard, the plates of earlier, obsolete bank notes were provided with new denominations and printed in different colors to distinguish them from their devalued predecessors.

Again, some comparison data to chart the course of the inflation are listed:

On December 31, 1945, 765,556 million pengo of notes were in circulation, with a dollar value of \$2,686,000. This was a sharp drop from the \$37,565,000 in circulation at the end of June 1945. The printers could not keep up with the pengo. One month later, on January 31, 1946, bank note circulation had risen to 1,646,000 million pengo, but the currency was still worth only \$2,118,000.

The bank notes which followed could no longer be expressed—for the people—in pengo units. The space available on the notes could not accommodate the long row of zeros required, while the general public was no longer willing to carry on business with bank notes representing such astronomical values. The government therefore decided to simplify the next bank note in the series, the 10,000 million or 10 milliard pengo, by striking out six zeros and issuing it as 10,000 milpengo (P 126). It appeared on May 27 with a date of April 29, 1946. A new unit of currency was thereby

introduced, the milpengo, defined as 1 million pengo. The 100,000 milpengo (P 127) also appeared on June 3, with an April 29 date. The 1 million milpengo was issued on June 12, and the 10 million on June 18, both dated May 24 (P 128, 129). Six days later the 100 million showed up, and three days thereafter the 1 milliard milpengo, both dated June 3 (P 130, 131). Within 24 days the currency had run through six orders of magnitude, and the milpengo was back where the pengo had been. All six of these milpengo notes used the same printing plates as the corresponding pengo notes, but with different colors.

501,324 billion pengo were circulating by June 7, 1946, but at an exchange rate of 480,000 milpengo to the dollar they were only worth \$1,044,000. On June 23, one day before the milliard milpengo note was placed in circulation, the total bank note issue was 78,424,250 billion pengo. But the dollar exchange rate had skyrocketed as well, and this currency in total was worth only \$2,159,615. Seven days later, 80 times as much money was circulating: 6,277,271,176 billion pengo. It took 1,817,000,000 milpengo or 1817 billion pengo to purchase one dollar, however, so the total value of the currency circulating was scarcely larger than before, \$3,454,744.

Bank note denominations had to be simplified again by striking off six more zeros at the beginning of July 1946 in the face of the same problems which led to the milpengo. This produced the b. pengo, a short-lived

unit defined as 1 billion pengo or 1 million milpengo. A 10,000 b. pengo note appeared on July 1, the 100,000 on July 2, the 1 million b. pengo on July 4, the 10 million on July 8, and the 100 million on July 11, 1946 (P 132-136). All b. pengo notes were dated June 3, including the unissued 1 milliard. These notes, like the milpengo before them, used the corresponding plates of the original pengo notes, but with a third set of colors and some simplification in backgrounds. The 1 milliard b. pengo was prepared with the others but never issued (P 137), for an Ordinance No. 2240/1946.P.M. decreed that all withdrawals from state and commercial checking accounts in the Postal Savings Bank must henceforth be paid only in adpengo or taxpengo. The obsolete and completely devaluated pengo bank notes must no longer be placed into circulation.

With this decree, pengo bank notes really ceased to be legal tender. They were replaced by the taxpengo notes expressed in adpengo values. The adpengo had begun as a purely computational unit, but ended by achieving a concrete reality of its own. Later on we shall describe a little of what life was like in the last days of the pengo-value currency.

The government continued to pay its bills by floating more paper. In May it delivered 112,000 billion pengo of new promissory paper to the National Bank, which obediently discounted them and paid for them with new bank notes. In June the same process was repeated with

securities having a face value (whatever their real value might be) of 20,047,800,000 billion pengó, or 20,047,800,000,000,000,000 pengó!

Circulation figures for July achieved an unreality which can only be appreciated by examining Table I. On the eve of the Second World War there were 545,000,000 pengó in circulation with a real value of \$102,830,000.

Less than seven years later, 76,047,075,417,532,000,000,000,000 pengó were being passed from hand to hand, but all this currency was worth less than \$25,000. Values fell to nothing as zeros rose to infinity. Never in the history of money had so drastic a collapse been seen.

From the middle of April to the middle of May 1946, the exchange rate for dollars rose by a factor of 80, and in the following four weeks by another factor of 3350. During this same four week period, worker's salaries rose by only 1250 times, even including the then-customary calorie allowance, a means of pegging wages to food prices. This meant that over a four-week period, wages only kept pace with 60 percent of the price increase. In the next four weeks even worse was to come. The hard-fought raises in wages only covered 33 percent of the price rise.

R.A. Banyai's monograph, *The Legal and Monetary Aspects of the Hungarian Hyper-Inflation 1945-46*, contains an erroneous interpretation of the concept of "calorie-money." Banyai says, "In early February 1946, a new money—called calorie money—was introduced...a government measure was enforced to the effect that a part of salaries and wages were paid in foodstuffs at a prescribed number of calories, depending upon the size of the wage earner's family..." This is wrong. "Calorie-money" was a supplement to a working man's salary depending on the difficulty of manual labor that he did. Heavy laborers for a time received a calorie bonus of 50

percent of their base salaries, light workers 20 percent and office workers, as well as intellectual workers, only 10 percent. "Calorie-money" was not a new kind of legal tender and was not a reckoning unit like the taxpengo. It was a device for insuring that hard-working laborers got enough to eat to keep going.

On June 26, the stock market index was 150 billion times that of before the war. In private transactions the exchange rates against gold and foreign currencies on June 26 were 250,000 times what they had been at the end of May 1946. At this period the one-week loan business stopped and was replaced by a one-day money market at 50 percent interest.

Somewhat earlier, especially in those rural areas where money was still accepted at all, one stopped calling bank notes by their denominations and identified them by their colors. With the introduction of the milpengó, this practice became general. Very few people could cope with the names of the bank notes or the many zeros associated with them. This is still true even today, but the summary in Table II may be of help.

The final act of the tragedy of the greatest inflation in the world was the appearance and short-two-months' lifetime of the adopengó or taxpengo notes. In the midst of a runaway inflation, Ordinance No. 11,600/1945.M.E., which established

the taxpengo as a computational unit, and No. 66,022/1946.P.M., which implemented it, were intended to create a stable unit of value, independent of daily changes, in which governmental accounts could be calculated. Later, as we have mentioned, the taxpengo slowly became a physical reality in terms of real bank notes.

Three groups of taxpengo notes can be distinguished: a. tax-notes or adójegy, expressed in adopengó; b. different dues-stamps expressed in adopengó, which served as smaller-denominations auxiliary notes, and c. non-interest-bearing certificates of the Hungarian Postal Savings Bank.

Adopengó tax-notes were authorized by Ordinance No. 5600/1946. (May 18, 1946), and implemented by Ordinance No. 136,600/1946.VII.P.M. (May 27, 1946). As was mentioned earlier, Ordinance No. 2240/1946.P.M. virtually eliminated pengó, milpengó and b. pengó as legal tender, and transferred this function to the taxpengo notes.

The adopengó (taxpengo) notes were certificates valid for two months, which would lose their value on their termination date without any necessity on the part of the government to redeem them. They were issued by the finance minister to facilitate the payment of taxes, etc. computed in adopengó. Thus they were initially not currency at all, but merely tax payment vouchers. Initially they were used





only for payment of taxes. Later, however, their role was widened to include all governmental obligations computed in adopengo, until finally the ordinances mentioned above recognized these tax-notes as lawful currency.

The first issues of adopengo notes, dated May 25, 1946, were for 50,000, 500,000, 1 million, 10 million and 100 million adopengo (P 138-142). The 10,000 and 100,000 adopengo were dated May 28 (P 143-144). The many printing and paper varieties of those notes can be blamed on the haste with which they were prepared. Tax-notes were prepared at first only at the Hungarian State Printinghouse, using printing plates adapted from a former charity lottery. Other bank note printers began making tax-notes later, since the demand for such notes was so great that the State Printinghouse alone was unable to keep up.

It is not easy to compare these adopengo notes with the paper pengo which were circulating alongside them in June and July, for the conversion factor changed constantly as the pengo depreciated. The taxpengo and paper pengo bank notes were identical on January 1, 1946. The taxpengo was worth 1.7 paper pengo on February 1, and roughly 100,000 pengo when the first taxpengo note appeared. The decline of the pengo was extremely rapid in the following eight weeks, until a final conversion factor was

reached at the end of July 1946 of 2 milliard b. pengo to one taxpengo (Table III).

For practical reasons, the 10,000 adopengo was the smallest note printed, since priority had to be given to the preparation of large sums in adopengo notes. However, tax bills for less than 10,000 adopengo also needed to be paid. Ordinance No. 136,300/1946.VII.P.M. therefore decreed that, for the payment of so-called fractional tax obligations, all tax or duty stamps for less than 50,000 adopengo would be recognized as auxiliary notes, with the exception of certain stamps used in payment of accounts duties. Payment of taxes by means of these stamps would be accepted during the same period of time in which payment of tax-notes was legal. The ordinance specifically denied auxiliary currency status to accounts-duty stamps and to tax stamps for more than 50,000 adopengo. The accounts-duty stamps were divided into two halves by perforations, and were worth their full value only when unseparated, which could easily lead to deception and fraud. The larger value stamps for 50,000 adopengo or more were not needed since taxpengo notes existed for those denominations. However, the general public was not familiar with the fine points of the ordinance and used any and all tax or duty stamps expressed in adopengo, making it impossible to keep these last two

categories out of circulation.

Adopengo values were overprinted on the deed stamps of types November 1, 1934, 1943 and October 10, 1945; on juridical dues stamps of November 1, 1934 and October 29, 1945; bill of exchange stamps of December 19, 1934; and accounts duty stamps of March 1, 1944. The issues which are known are listed in Table IV. The document duty stamps of March 5 and June 5, 1946 were originally printed in adopengo values.

Of the various duty stamps overprinted 100, 300, 500, 1000, 2000, 5000, 10,000, 20,000 and 50,000 adopengo, and initially printed 1000 (1 ezer), 2000, 5000, 10,000, 50,000 and 100,000 adopengo, a total of 68 different types came into use, exception overprint variations. How many of these were actually used as auxiliary currency in addition to their duty stamp role is impossible to say now because of the confusion and "ad hoc" management of the state printinghouse. One can establish, however, that some of these duty stamps were prepared in small numbers and hence today are quite rare.

Also interesting from this period are the "non-interest-bearing certificates" expressed in adopengo, which were circulated by the Hungarian Postal Savings Bank in the latter half of June 1946. In time these certificates came to be treated as circulating paper money just as the Hungarian National Bank notes or the taxpengo notes and stamps. These non-interest-bearing certificates were deliberately brought into circulation to facilitate payment of bank deposits expressed in taxpengo. Later the restrictions laid down by the Postal Savings Bank were lifted: signature requirements, limited validity of only five days after issue, non-transferability and the rule that the certificates could only be cashed by the owner (or rather, the depositor). These vouchers acquired the character of a real currency on July 4, 1946 and thereaf-



ter circulated as any other paper money.

These non-interest-bearing certificates were issued undated in tizezer (10,000), szazezer (100,000), egymillio (1 million) and tizmillio (10million) adopengo values (P145-

158). The many varieties of these notes arose partly because of the haste with which they were prepared and partly because they were only thought of as interim notes.

Total savings certificates issues were as follows:

10,000 adopengo	191,200 notes
100,000 adopengo	154,000 notes
1 million adopengo	115,000 notes
10 million adopengo	140,000 notes
Total:	599,200 notes

The total face value was
1,531,312,000,000 adopengo.

Table I
The Fall of the Pengo and the Shrinkage of Circulating Currency

Date	Currency in Circulation	Dollar Exchange Rate	Total Dollar Value of Circulating Currency
Dec 31, 1937	545 MP	5.30 P	102,830,000
Jan 31, 1945	20,766 MP	250 P	83,000,000
June 30, 1945	23,572 MP	627 P	37,565,000
Dec 31, 1945	765,446 MP	285,000 P	2,686,000
Jan 31, 1946	1,646,000 MP	778,000 P	2,118,000
June 7, 1946	501,324 BP	0.48 BP	1,044,000
June 23, 1946	78,424,251 BP	35.30 BP	2,159,615
June 30, 1946	6,277,271,176 BP	1,817 BP	3,454,745
July 7, 1946	3,563,271,912,633 BP	2,907,000 BP	1,225,756
July 15, 1946	76,047,075,417,532 BP	3,271,500,000 BP	23,245

P = pengó

MP = milpengó (1,000,000 pengó = 10⁶ pengó)

BP = b. pengó (1 billion pengó = 10¹² pengó)

Notice that even as the face value of currency in circulation rose to unheard-of heights, the real value of this currency could only be maintained at one to three percent of its prewar level.



The great majority of these notes were redeemed, canceled and destroyed, which explains why these issues are considered such rarities today even in a cancelled state.

Now let us turn back from the notes to the inflation itself. As we have seen, on July 9, 1946, the role of the pengo bank notes as legal tender was taken over by tax notes in the various forms that we have just been

considering. These changes were accepted without friction and with a certain sense of relief, since most accounts, as we have said, were already being kept in adopengo. From this time on, the quantity of bank notes circulated by the Hungarian National Bank fell rapidly, partly because new bank notes were not manufactured and did not come into circulation, and partly because those which were circulating flowed back promptly into the National Bank. In the Hungarian National Bank circulars of July 7 and 15, no increase in bank note circulation is reported over previous periods, and the publication of July 23 indicates a 50 percent diminution. This circular shows that the total bank notes outstanding sank from a previous value of 76,047,075,417,531 b. pengo

Table II
The Inflation of Bank Notes of the Hungarian National Bank
(From May 9, 1945 to July 11, 1946)

Denomination	Date on Note	Date Placed in Circulation	Denomination in Power-of-Ten Notation
50 P	5. 4. 1945	5. 7. 1945	5×10^1
100 P	5. 4. 1945	9. 5. 1945	10^2
500 P	15. 5. 1945	1. 6. 1945	5×10^2
1,000 P	15. 7. 1945	16. 7. 1945	10^3
10,000 P	15. 7. 1945	17.10. 1945	10^4
100,000 P	23.10. 1945	12.12. 1945	10^5
1 Million P	16.11. 1945	28. 2. 1946	10^6
10 Million P	16.11. 1945	2. 4. 1946	10^7
100 Million P	18. 3. 1946	30. 4. 1946	10^8
1 Milliard P	18. 3. 1946	13. 5. 1946	10^9
10,000 MP	29. 4. 1946	27. 5. 1946	10^{10}
100,000 MP	29. 4. 1946	3. 6. 1946	10^{11}
1 Million MP	24. 5. 1946	12. 6. 1946	10^{12}
10 Million MP	24. 5. 1946	18. 6. 1946	10^{13}
100 Million MP	3. 6. 1946	24. 6. 1946	10^{14}
1 Milliard MP	3. 6. 1946	27. 6. 1946	10^{15}
10,000 BP	3. 6. 1946	1. 7. 1946	10^{16}
100,000 BP	3. 6. 1946	2. 7. 1946	10^{17}
1 Million BP	3. 6. 1946	4. 7. 1946	10^{18}
10 Million BP	3. 6. 1946	8. 7. 1946	10^{19}
100 Million BP	3. 6. 1946	11. 7. 1946	10^{20}
1 Milliard BP	3. 6. 1946	Not issued	10^{21}

P = pengo

MP = milpengo (1 million pengo = 10^6 pengo)

BP = b. pengo (1 billion pengo = 10^{12} pengo)

to only 41,239,566,639,511 B. pengó. The difference between these amounts poured back into the National Bank within a one-week period. After July 9, the bank could only replace these pengó notes, barely out before they returned again, with adpengó. These grotesquely inflated numbers associated with pengó currency circulation actually correspond to no real monetary value at all—the best example of which is the fact that

toward the end of July, the entire bank note circulation of the Hungarian National Bank for one day could not have purchased a single cigarette!

Until July 9, the taxpengó served as a yardstick against which to measure the fall of the pengó. From this day on, however, things were different. As soon as the taxpengó became the legal tender, it too began to be tainted by the sickness of inflation. Like any other legal

tender, it was forced to join the steady march toward worthlessness. The pengó, in an ironic reversal of roles, then measured the daily devaluation of the adpengó. The erosion of the adpengó is shown in Table V.

The citizenry, who by their own sufferings had acquired a certain knowledgeability about matters of devaluation, soon noticed that the adpengó was a sick currency as well and began withdrawing their

Table III
Conversion Factors Between Pengó and Adpengó
(From January 1 to July 29, 1946)

	January	February	March	April	May	June	July		
1	1.-	1.70	10.-	44	630	160000	7500	MP	
2	1.-	1.70	10.64	51	630	198000	27000	MP	
3	1.-	1.70	12.15	56	780	198000	95000	MP	
4	1.-	1.70	12.15	59	910	240000	340000	MP	
5	1.04	1.70	12.90	59	1120	310000	1.2	BP	
6	1.04	1.96	13.30	67	1120	405000	3.9	BP	
7	1.08	2.16	13.92	76	1370	610000	12	BP	
8	1.09	2.29	14.40	76	1570	860000	12	BP	
9	1.10	2.36	14.70	86	1730	1.12	MP	50	BP
10	1.09	2.42	14.90	91	2120	1.12	MP	200	BP
11	1.08	2.42	14.90	102	2560	1.12	MP	600	BP
12	1.08	2.45	16.30	106	2950	1.77	MP	1600	BP
13	1.07	2.54	16.80	120	2950	2.40	MP	4500	BP
14	1.08	2.63	17.20	133	3700	3.60	MP	13500	BP
15	1.08	2.71	18.40	133	4400	5.60	MP	13500	BP
16	1.10	2.90	18.40	155	5100	8.30	MP	40000	BP
17	1.15	3.12	18.40	170	6500	8.30	MP	120000	BP
18	1.17	3.12	18.40	194	8400	14.50	MP	360000	BP
19	1.23	3.41	20.30	215	10900	22	MP	1.1	TP
20	1.28	3.90	21.90	232	10900	40	MP	2.5	TP
21	1.28	4.17	23.90	260	14500	40	MP	7	TP
22	1.33	4.56	24.80	260	17400	90	MP	7	TP
23	1.35	5.39	27.60	260	21400	150	MP	20	TP
24	1.41	6.25	30.20	320	29300	150	MP	50	TP
25	1.44	6.25	30.20	395	40000	290	MP	120	TP
26	1.50	7.16	30.20	415	56000	530	MP	300	TP
27	1.55	8.82	33.-	460	56000	1130	MP	700	TP
28	1.55	9.85	35.-	520	71000	3000	MP	2000	TP
29	1.56	----	38.-	520	85000	7500	MP	----	
30	1.63	----	42.-	570	108000	7500	MP	----	
31	1.64	----	44.-	---	108000	----	----	----	

MP = milpengó (1 million pengó = 10^6 pengó)

BP = b. pengó (1 billion pengó = 10^{12} pengó)

TP—1 trillion pengó = 10^{18} pengó

adopengo savings accounts. On July 13, the total of savings accounts stood at 947,481 million adopengo, but by July 20 this had fallen to 472,827 million. These figures, however, do not accurately reflect the magnitude of the run on the savings banks and the "every-man-for-himself" hysteria, since the total amount of withdrawals was limited by the sums that the Hungarian National Bank would release to the various savings banks from its

"Account K." These sums in turn were really limited by printing methods, for even with the help of other bank note printing houses, the daily demands for adopengo simply could not be met. The money thus withdrawn poured unchecked into the market in search of real goods and led to a new round of price increases.

On July 15, 1946, 15,646,410,840,000 adopengo were circulating, and one adopengo was

worth 13,500 b. pengó. The official dollar exchange rate was 242,300 adopengo, but the black market rate was 29,318,000 adopengo. On July 23, the note issue had risen tenfold to 174,857,240,460,000 adopengo, which at black market rates was only worth \$579,000. The progress of the conversion factor between pengó and adopengo can be seen in Table III.

So far we have been chiefly concerned with the inflation in the

Table IV
Adopengo Overprinted Dues Stamps as Currency

Types:	I. Okirati illetek (Deed stamps)	
	I. a	1934
	I. b	1943
	I. c	1945
	II. Torvénykezesi illetek (Juridical dues stamps)	
	II. a	1934
	II. :	1945
	III. Valto illetek (Bill of exchange dues stamps)	
	IV. Szamla illetek (Accounts dues stamps), 1944	
Adopengo overprint	Type of stamp	Original denominations
100	Ia	5,10, 20, 40 filler
	III	3,15, 30, 45, 60 filler
		1.50, 2.40, 3, 7.50 pengó
300	Ia	4 filler
500	Ia	5,10 filler
	IV	5 filler
1,000	Ia	2, 50 filler
	Ib	3 pengó
	IIa	10, 15, 20, 30, 40, 50 filler
		1, 2 pengó
	IIb	1 pengó
	IV	10 filler
2,000	Ia	1, 2 pengó
	Ic	1, 2, 5 pengó
	IIb	2 pengó
5,000	Ia	5 pengó
	Ic	50 filler
	IIb	4, 5 pengó
	III	3 filler
	IV	2.50 pengó
10,000	IIb	10 pengó
	IV	3 pengó
20,000	Ia	2, 20 filler
	IIb	30 pengó
	IV	4, 5, 6 pengó
50,000	IIa	5 pengó
	IV	50 filler

capital city of Budapest. But what was going on during this same period in the countryside? A barter economy had sprung up in the country since the end of the war, partly because not enough money was available and partly because the farsighted peasants refused to accept money for their produce. The chief currency of this barter economy was eggs and grain. Whenever anyone received paper money in the country, he quickly carried it back to the city and bought whatever he could with it.

The pengo-value unit in 1926 had been defined as equal to 263.16 milligrams of fine gold and remained stable until the gold convertibility was removed in 1931.

On July 29, 1946, a new gold-linked currency unit came into being, the forint (Hungarian florin). It was set as equal to 75.7 milligrams of fine gold and was to be exchanged against the old currency at the rate of 1 forint for 200 million adopengo. The dollar exchange rate was \$1 for 11.74 forint. Stability

returned, and so ended the tragedy of the pengo-value, which indeed could be called the greatest inflation in the world.

A few last figures to round out this tragedy are presented: The world's largest denomination bank note, the 1 milliard b. pengo, equalled 1,000,000,000,000,000,000,000 pengo. On the date the forint was introduced, 1 adopengo was worth 2 milliard b. pengo or 2,000,000,000,000,000,000,000 pengo.

The largest tax dues stamp used, 100,000 adopengo, was equivalent to 200,000,000,000,000,000,000,000 or 2×10^{26} pengo.

The largest postal savings certificate, 10 million adopengo, equalled 2×10^{28} pengo, which became one-twentieth of a forint, or 5 filler.

The largest adopengo note, and the pinnacle of the entire inflation, was 100 million adopengo. This corresponds to 2×10^{29} pengo or a half forint—50 filler.

President's Message — Continued from Page 1

my wildest dreams would I be able to afford to collect it all! Thus I decided to specialize in one area, French Indochina and the successor states: Cambodia, Laos and Viet Nam. So much for the objective, at least in broad terms.

The *focus* came later, and here's where I.B.N.S. enters the picture. In 1977 I was stationed in Darmstadt, Germany. Joe Boling, whom I had met earlier in the States, and Howard Daniel were in Heidelberg, and they suggested that I join them on a trip to London to attend an annual meeting of an organization called the International Bank Note Society. "Why not?" I thought. After all, I had never been to London before. Meeting so many other helpful and friendly people who shared my collecting interests; pouring over the vast array of notes in the offices of Stanley Gibbons and talking with Colin Narbeth, Yasha Beresiner and David Hyles, all of whom worked there then; browsing through the tables of the dealers at the bourse; and listening to the fantastic presentations in the Congress' educational program well, friends, I thought I had died and gone to heaven! Perhaps most importantly, though, it was Allistair Gibb's superb presentation on serial number-signature variety correlations on British bank notes that especially awed me. His talk was the single most significant event in influencing and shaping my collecting and research interests for the future. In short, after the London I.B.N.S. Congress of 1977 I had a *FOCUS* on my hobby that was lacking before, and it was through I.B.N.S. and the wonderful people in it that I was able to get it.

The 23rd Annual I.B.N.S. London Congress is coming up on October 9 and 10. Unfortunately, I'll be teaching school at the time and will be unable to attend this year. I'm going to sorely miss it and the wonderful people and experiences that make the Congress the outstanding event that it is. But if you can, do attend. You just might find that aggravating elusive note you've been searching for, and who knows you may even be able to pick up a little free "focus"! You, too, can go to heaven; and you don't even have to die to do it!

Warmest regards

Clyde Reedy, President

Table V
Inflation and the Adopengo

Date	Prices in adopengo (taxpengo) (January 1, 1946 equivalent 1.0)
Jan. 1, 1946	1.0
Feb. 1, 1946	1.0
March 1, 1946	1.0
April 1, 1946	1.0
April 18, 1946	1.5
April 19—May 31, 1946	1.9
June 1-19, 1946	5.9 (Adojegy—taxpengo note issued on June 1, 1946.)
June 20 - July 8, 1946	21.9
July 9-15, 1946	116.0 (Adopengo became legal tender on July 9, 1946.)
July 16-23, 1946	981.5
July 24-27, 1946	37,037.1
July 28-31, 1946	8,518.5 (Forint established on July 29, 1946.)

Notice that for five months after its introduction the adopengo (taxpengo) depreciated by less than a factor of two. As long as the adopengo was only an invisible "computational" unit, the pengo (milpengo, b. pengo) bore the brunt of inflation. The first shift in value of the adopengo came shortly after it was given tangible form in the adojegey (tax-note) of June 1. Its real and rapid downfall took place as soon as it became legal tender on July 9, 1946 and thus replaced the shattered pengo. Stability returned when the new forint and the fixed rate of exchange against adopengo were announced on July 29, 1946.

Security Threads

by Peter Symes, I.B.N.S. #4245

With the increasing diversity of new security features in bank notes—such as optically variable devices, microprinting and light sensitive inks (see article in this issue by Dr. Anthony Michaelis)—it is perhaps timely to look at the history of the “security thread,” one of the most successful and enduring security features in modern bank notes.

The idea of embedding a foreign material in bank note paper has been around for many years—one of the earliest attempts being made by Benjamin Franklin. For a period of time Franklin was a printer, and printed notes for some of the American states. In an attempt to increase the inimitability of the notes, he manufactured paper with crushed mica embedded in it.

J.M. Wilcox of Philadelphia continued this tradition by patenting his “Wilcox” paper around 1860—his paper having blue jute fibres scattered in a vertical strip in the paper.

The use of embedded fibres continues today, usually with the embedding of natural materials such as silk and jute. However there are variations on the type of scattered materials and these include fluorescent fibres, planchettes, and printed color strips.

Whilst it was natural for the development of scattered fibres to continue, it was only a matter of time before someone would introduce a continuous fibre into the paper. The first attempt to do just that can be seen in the 1871 issue of “El Banco de España.” In this issue we see a worsted fibre that is used in exactly the same way as our modern security threads.

The use of the worsted fibre seems to have been for the single issue, but several years later in 1895,

another issue of “El Banco de España” had a continuous “bandage” of woven red and blue threads appearing on the front of the note. Apparently both these ideas from Spain were ahead of their time, and the bank did not continue with the use of either device.

The modern security thread was developed in the 1930's as a joint project between Stanley Chamberlain of the Bank of England Printing Works and Messers Portals Ltd—the supplier of bank note paper to the Bank of England. The result of their research and development was the metallic security thread known as the “Chamberlain” thread and this is the security thread that most of us are familiar with.

The Bank of England first used this thread in their £1 and 10 shillings issues of 1940; however it is probable that the first use of the metallic thread was in the one pound issue of South Africa dated 19.9.1938. This appears to have been a trial use of threaded paper supplied by Portals, as only series A78 of the issue was printed on the new paper, and subsequent issues did not have the thread.

The Bank of England welcomed the arrival of this new security feature, as the years immediately following gave them some concern with the discovery of the German forgeries of their “white” notes. The quality of the forgeries were such that on their detection, the Bank of England determined to introduce the new security feature to the higher denominations. Consequently the £5 notes (“white fivers”) were issued with metallic threads from 1944.

Because of the Bank of England's relationship with Portals, or because the patent for the metallic thread

was held by Chamberlain, or possibly because of the cost of the paper—the immediate adoption of metallic threads by note issuing authorities was not universal, despite its obvious attractions.

However, after a period of time, more and more bank notes were being issued with the new security feature. The Clydesdale Bank in Scotland introduced metallic threads in their issue of 1950, with many other countries following suit in the ensuing years. By the time Australia introduced decimal currency in 1966 the metallic thread was quite common around the world.

When the metallic thread was first introduced it was probably made of steel—indeed it is often referred to as the “steel band.” However the type of steel used is a closely guarded secret, as it must be flexible enough to avoid the tearing of the paper and stable enough not to cause deterioration of the paper.

One interesting exception to the initial use of steel threads were the bank notes of Saudi Arabia—they used silver threads. This interesting alternative was chosen by the Saudi government because, until the issue of their bank notes, their economy was backed by silver coins and silver reserves, and they wished to retain a link with their silver standard.

Not satisfied with the development of the security thread as a single ribbon of metal embedded in paper, the developers of security features worked hard in trying to enhance the properties of the threads. One of the most obvious changes to the threads, is the use of synthetic materials rather than metal. The use of synthetic materials has led to some interesting devel-

opments in the production of security threads—which we will look at, each in turn.

One development is the “Morse code” thread, such as is found in the issues of the Bank of Scotland since 1968, and the issues of Kuwait from 1960 to 1968. When held to the light, the security thread is not solid, but is broken into a series of short and long solid sections separated by translucent sections. When the solid sections are interpreted as the “dots and dashes” of Morse code they spell a particular word or phrase. The notes of the Bank of Scotland have the letters BOFS (for “Bank OF Scotland”) and the notes of Kuwait have KUWAIT spelt in their threads.

A simple variation on the Morse code thread is the “broken” thread—which can be seen on the latest issues of the Philippines. This thread has the solid and translucent sections like the Morse code thread, but the solid and translucent sections are uniform in length.

Another development of the security thread is the “microprinted thread.” In most cases, microprinting occurs on the synthetic threads, and the microprinting can be observed by holding the bank note to a strong light. With normal eyesight the microprinting takes on various aspects, from that of a “chain,” to small dots, to the likeness of a poorly produced metallic thread—depending on what has been written, and the quality of the printing.

When magnified under good light, it is possible to read the microprinting. The contents of the microprinting vary, from the initials of an authority—such as the “UAE” that appears on the latest issue from the United Arab Emirates, and the “RBS” that appeared on the issues of the Royal Bank of Scotland from 1967 to 1986—to the full name of the authority or country—such as “INDONESIA,” “QATAR MONETARY AGENCY,” and “BANCO CENTRAL DE BOLIVA” on the latest issues of the respective countries.

Usually the microprinting is printed so that it can be read only from one side of the bank note, the printing appearing in reverse when read from the other side. The new \$100 notes from the United States of America have addressed this problem by having “USA 100” printed repeatedly on the thread so that it can be read alternatively from the face and the back.

Whilst we often find it difficult to read the microprinting, further difficulties arise when some countries have the microprinting done in their own scripts. The notes of Thailand have microprinting in Thai script, and the latest issue from Oman is in Arabic.

Interestingly, microprinting can be done on a metal thread, as can be seen in the latest issue of Saudi Arabia. When held to the light the thread appears solid and there is no reason to doubt that the threads are not still made of silver. When laid down, submitted to good light and magnification, the letters SAMA can be seen—for “Saudi Arabian Monetary Agency.”

Another development is the “contoured” thread, which has one straight side and one side with a contoured or wavy pattern. The thread is actually the product of a wider thread cut in two by a computer controlled laser beam, and was first developed by the Bank of England and the U.K. Atomic Energy Authority.

The contoured thread made its first appearance in the £50 note of the Bank of England in 1981, and has subsequently been used in the five hundred kronor note of Sweden that was issued in 1986. An interesting point to note is that because each thread is the result of splitting one thread into two, the wavy side of the security thread can face either to the left or the right of the bank note.

One further development with the security thread is to make it react with ultraviolet light. This feature can be seen on the recent notes of Bolivia, where the security thread

glows (or fluoresces) dark blue when placed under ultraviolet light. This feature will probably become more popular as the use of ultraviolet sensitive inks on bank notes is becoming more common.

Modern security threads have usually been black, but bank notes are now appearing with colored threads. The latest five piso note from the Philippines has a green broken thread, and the commemorative 60 baht note from Thailand has a broken thread that has translucent, blue and red sections.

The Thai note is a particularly good example of illustrating how the many variations of the modern security thread can be combined in one issue. Not only is it a broken thread, but it has two colors, it has microprinting and the blue sections of the thread fluoresce under ultraviolet light.

The latest development in the use of security threads is the windowed or “Stardust” thread, which was also developed by the Bank of England Note Printing Works. When viewing notes with this feature from the rear, the thread looks like any other metal thread (except that it is wider than usual), but when viewed from the front, the thread looks as if it has been woven through the paper.

The windowed thread first appeared in the £20 Bank of England note when it was modified in 1984 and has subsequently been used in notes from many other countries including Malaysia, Turkey, Sri Lanka, Germany, Nigeria and New Zealand.

The main reason for the development of the windowed thread, was the need for a device that could not be easily photocopied. For this reason the exposed areas of the thread have a lustre that will not be replicated when the note is copied. The 1990 issues of Germany feature a windowed thread that is coated with aluminum and it is not unreasonable to postulate that other windowed threads are coated with the same material.

The lustre on the windowed threads is important as it is impossible to photocopy. This distinctive feature has recently been copied by the West African States who have placed a tape on the front of their notes to the left of the security thread. The tape is clear with sections of a shiny metallic surface at regular intervals, thus inhibiting forgery by photocopying.

The security thread has certainly become a common device in the production of modern bank notes, and as with any good security device, it can be redesigned in many ways to incorporate additional

features. The proliferation of these additional features is making it both more difficult for would-be counterfeiters and more interesting for bank note collectors.

Whilst it is possible that the future direction of bank note manufacture lies with plastic, it is probable that only a few authorities will be issuing their notes in plastic in the next ten to twenty years. For this reason, we will still be seeing the security thread in all its manifestations for some time to come—and who knows, we may yet see a security thread in a plastic note.

The final mention in this discus-

sion of security threads, must go to the metal thread that wasn't! During the Nigerian civil war (1967-70) Eastern Nigeria declared itself independent under the name of the Republic of Biafra. Biafra's first issue of bank notes was in the denominations of five shillings and one pound, and on these notes appeared a string of printed marks designed to look like a "Morse code" thread. Perhaps they did their job—most likely they didn't—certainly their second issue had neither a real thread nor a "pretend" one!

Confederate States Paper Money

Latest price updates, more pictures, more pages, and a larger format highlight the newly released eighth edition of *Confederate States Paper Money*, the classic reference by Arlie Slabaugh.

The book now totals 128 pages - 16 more than the seventh edition and more than double the number in the first edition, released in 1958.

"It could have been even larger and more detailed," Slabaugh writes in the book's preface, "but it should be understood that this catalog is intended primarily for the general reader and collector rather than the specialist. Nevertheless, whether one is a novice or an advanced collector or student of the Civil War, I believe those consulting this catalog will find things of interest not readily available elsewhere."

The new 6-inch by 9-inch format allows for larger photographs of each note and related historical memorabilia. The new edition totals almost 150 photos - 10 more than the seventh edition.

The author has also completely updated values for each note. Each listing is valued in six grades: good, very good, fine, very fine, extra fine, and uncirculated.

Prices are retail values, or what you can expect to pay approximately when buying notes from a dealer.

"Buying prices will probably average about 60% of the listed price," Slabaugh writes in the book's introductory chapters. "Rare notes and those that are popular and in demand may realize nearly full retail but worn notes, especially of the more common kinds, may not realize 50%."

Other introductory material includes historical perspectives on the war and the South's economy in the mid-1800s, which are important aspects to collecting Confederate currency.

"Too many collectors and owners of coins and paper money tend to make a beeline to the catalog section that lists the prices of what each specimen is worth," Slabaugh writes. "This is a habit that must be broken if one is to become an informed collector."

"Not only that, the knowledge gained by studying catalogs in detail will bring you pleasure. Only then will you fully appreciate the value of what you own or seek to obtain."

Confederate States Paper Money can be purchased from numismatic book dealers or directly from the publisher, Krause Publications, Book Department NR, 700 E. State St., Iola, WI 54990-0001, for \$12.95. Add \$2.50 shipping for each book purchased. Wisconsin residents must add 5 1/2-percent sales tax.

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MINUTES OF THE MEETING OF THE EXECUTIVE BOARD OF THE INTERNATIONAL BANK NOTE SOCIETY

4 APRIL 1993, MAASTRICHT, NETHERLANDS

The meeting was convened by President Reedy at 8:00 AM in the Valkenberg Cocarde.

Present were President Reedy, 2nd Vice-President Eijssermans, and board members Barlock, Blackburn, Burson, Narbeth, Spick, Steinberg, Turner, Underwood, and Vostal. Pam West and Margaret Spick were present as observers.

The minutes of the London meeting were approved.

MOTION was made (Narbeth), seconded (Eijssermans) and PASSED to rescind the vote of thanks to Suresh Gupta which was passed by the Executive Board in London.

The General Secretary's report indicated a net gain of 165 members during 1992 (to 2269). The Treasurer's report indicated a gain of US\$ 3000 in assets during the past year despite reductions in interest and exchange rates. Steinberg expressed the view that the Society should not keep increasing its funds but use such gains for member services. The Education Committee (Smulczewski) reported that a paper money seminar for I.B.N.S. members is being planned for the day prior to the Memphis show in 1994. The European Secretary/Treasurer's report (Thowney) indicated that from data provided by her predecessor (Gupta) 209 members are shown as not having paid their dues for from two to four years. Some of these members when contacted affirmed that they did make payment. President Reedy noted that there are still a number of unclear aspects regarding previous handling of European funds, but that in the long term interests of the Society he does not plan to pursue the matter unless there are objections. In the meantime he directed that the memberships in question be continued until the next renewal dates.

Applications for Life Membership were approved for the following: Francis Doyle; Alain Solomko; Josef Truyol; Michael Knabe; Brian Stubbs; and, Hugo Van Reijen.

MOTION was made (Eijssermans) and seconded (Underwood) to permit the General Secretary to issue Life Membership documentation on application, subject to subsequent ratification by the Board. MOTION PASSED.

First Vice-President Campbell is preparing a pamphlet on world paper money for publication by the PCDA (Professional Currency Dealers Association). He offered to obtain copies for the I.B.N.S. at cost for distribution to the members. MOTION was made (Burson) and seconded (Blackburn) to approve the expenditure of up to \$2000 for the procurement and distribution of these pamphlets to the membership.

MOTION was made (Narbeth) and seconded (Turner) to approve the following change to Article II, Section 7 of the I.B.N.S. bylaws. MOTION PASSED BY THE REQUISITE 2/3 MAJORITY.

"f. No person who is under suspension, or has been expelled, from the Society for violation of the Society Code of Ethics shall be allowed to participate commercially by having, operating or working behind a table or other location at which numismatic material is being bought, sold, traded, or exchanged at any public meeting, show, bourse, or other activity or function sponsored or co-sponsored by I.B.N.S. or any chapter thereof.

g. The name and last known address of persons expelled from the Society for violation of the Society Code of Ethics shall be published in the *I.B.N.S. Journal*, and shall be prominently displayed in each issue of the I.B.N.S. membership directory."

MOTION was made (Burson) and seconded (Underwood) to approve the following change in paragraph 5e of the Procedures to be Followed in Implementation of Article II, Section 7 of the bylaws. MOTION PASSED.

... A concurring vote by two-thirds (2/3) of the board members present and voting shall be required to reach a decision. [The remainder of the basic paragraph is deleted; numbered subparagraph remain as is.]

The Board, acting in Executive (closed) Session, directed the expulsion of the following members for violations of the Society Code of Ethics:

1643-F Suresh and Saroj Gupta, 11 Middle Row, North Kensington, London W10 5AT, England
4072 M. Coeshaw, P.O. Box 115, Leicester LE3 8JJ, England

NOTE: one other member was expelled, but that action is under review per action taken at the Memphis Board meeting.]

Returning to open session, President Reedy reported that I.B.N.S. Treasurer Stickles has indicated that he would like to step down effective with the AGM in Memphis on or about 19 June. MOTION was made (Steinberg) and seconded (Underwood) to appoint Joseph Boling to the position of Treasurer of I.B.N.S. upon the resignation of William Stickles from that post effective immediately, with explicit authorization to take all appropriate steps to prepare for transfer of responsibility and custody of I.B.N.S. funds. MOTION PASSED.

President Reedy nominated William Stickles for the position of Honorary Director For Life. MOTION was made (Eijssermans) and seconded (Blackburn) that outgoing Treasurer William Stickles be designated as Honorary Director For Life #3 and that the President be authorized to procure suitable mementos honoring Mr. Stickles' service to I.B.N.S. to be presented to him in Memphis in June. MOTION PASSED UNANIMOUSLY.

President Reedy announced that the Nominating Committee for the 1994 Society election will be chaired by Pam West.

The Board discussed the possibility of setting aside funds of the order of US\$5000 for paper money research scholarships. No action taken.

The Board approved the expenditure of \$250 to support education programs by the Turkish Chapter.

The meeting adjourned at 10:00 AM.

Classified Ads

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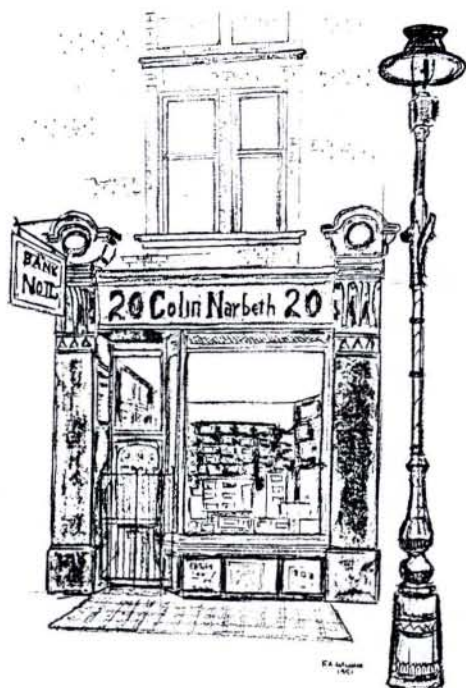
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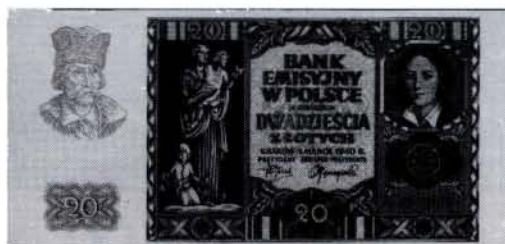
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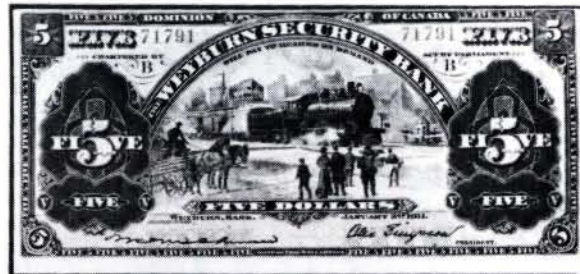
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